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Profile of the New York Zoological Society

Founded in 1895, the New York Zoological Society consists today of six major divisions operating facilities in the United States and worldwide: the New York Zoological Park (Bronx Zoo); the New York Aquarium and Osborn Laboratories of Marine Sciences in Brooklyn; the Wildlife Survival Center on St. Catherines Island, Georgia; Wildlife Conservation International (WICI), headquartered at the Bronx Zoo; and the City Zoos in Central Park, Prospect Park, and Flushing Meadows Park, soon to be renovated and managed by the Society. WICI supports active research projects in countries ranging from the People's Republic of China to Belize, and maintains stations in the Kibale Forest, Uganda; Valdes Peninsula, Argentina; and Amboseli National Park, Kenya. The Society's staff of 444 in all divisions includes curators, educators, veterinarians, animal keepers, research scientists, writers, administrators, artists and designers, photographers, gardeners, technicians, and a host of other support and maintenance specialists.

The *Bronx Zoo* and *New York Aquarium* are sensitive and popular tools for teaching environmental education in the nation's urban capital. Serving a metropolitan New York population of more than 17,000,000, as well as visitors from around the world, they combine nature, recreation, and education as do no other city institutions. In particular, they seek to arouse an interest in wild creatures and to stimulate compassion for them. In recent years, the captive collections of the Zoo and Aquarium, totaling more than 26,500 individual animals, have begun to fulfill a new, if unwanted role as long-term repositories for vanishing species, sustaining and perpetuating rare and delicate creatures which are disappearing in nature.

The *Wildlife Survival Center*, founded in 1974, is wholly devoted to the propagation and study of endangered species, and acts as a kind of distribution center for the renewal not only of zoo collections but also of nature itself.

The *Osborn Laboratories of Marine Sciences*, adjacent to the Aquarium and an integral part of its programs, has devoted its resources since 1968 to basic studies in the mechanisms of heredity, to the characteristics and cure of fish diseases (with a special view toward the application of this work to aquaculture), and to broad investigations in marine ecology.

The objective of *Wildlife Conservation International* is to save pieces of nature. WICI is the country's senior non-governmental program sponsoring international wildlife conservation and research. As George Schaller, WICI Director, has written, "We strive to obtain a better understanding of the structure, functioning and stability of large ecosystems and to apply this understanding to their conservation." WICI's distinctive approach has already re-

sulted in the creation, enlargement, or strengthening of more than fifty reserves and parks, and in the education of many to whom the future is entrusted.

The *City Zoos Project*, now in progress, will magnify the Society's public service throughout the New York metropolitan area, creating an entirely new and modern system of wildlife management and exhibition facilities, with emphasis on educational opportunities for children and adults alike. The three zoos are scheduled to be renovated and reopened by the end of the 1980s.

1984-85 Highlights and Vital Statistics

Attendance at New York Zoological Society facilities achieved its highest total since 1972, with 2,167,386 at the Bronx Zoo and 608,563 at the New York Aquarium between July 1, 1984, and June 30, 1985.

Membership in the Society reached 27,070, and about 46,000 individuals, foundations, and corporations contributed \$21,046,175 in dues, gifts and bequests.

Born or hatched at the Bronx Zoo, New York Aquarium, and Wildlife Survival Center during calendar year 1984 were more than 1,600 mammals, birds, reptiles, amphibians, and fishes, among them individuals of 69 endangered, threatened, or vulnerable species.

Noteworthy offspring included Tunko, Tuma, and Jamie, lowland gorillas; Bernadette, proboscis monkey; six Przewalski's horses; three pudus; four snow leopards; seventeen red-fronted macaws; eleven Guam rails; four Mauritius pink pigeons, eight false gavials; and five Chinese alligators.

At the end of 1984, the New York Zoological Society was responsible for 4,260 animals of nearly 750 species and subspecies at the Bronx Zoo; 250 animals of 41 species at the Wildlife Survival Center; and 22,417 animals of 298 species at the New York Aquarium. About 250 of these species are listed as endangered in some degree.

Interzoo breeding exchanges involved 545 animals loaned to or by 101 different institutions and the Society.

JungleWorld's tropical Asian habitats and interpretive galleries opened on June 22, and the Animal Health Center on April 30, 1985, both at the Bronx Zoo. Construction of the new Central Park Zoo began on April 8. At the Aquarium, the entrance area was completely renovated and the seawater intake system neared completion.

Wildlife Conservation International (WICI) sponsored 61 projects in 28 countries, including new efforts in Burundi, Central African Republic, Gabon, Kenya, Zaire, Guam, Indonesia, Malaysia, Thailand, China, Belize, Costa Rica, Mexico, Argentina, Venezuela, and the United States.

New York Zoological Society Annual Report 1984-85



White-handed gibbon in motion. Drawings by Deborah Ross of the animals in JungleWorld appear throughout this report.

The City of New York, through its Department of Cultural Affairs, provides annual operating support for the Bronx Zoo and the New York Aquarium, both of which occupy City-owned buildings on City-owned property.

The Society also receives funds annually from the Natural Heritage Trust, a program of the New York State Office of Parks and Recreation.

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Throughout this report you will find news of JungleWorld, from the General Director and the departments of Mammalogy, Ornithology, Herpetology, Zoo Education, Exhibition and Graphic Arts, and Operations. Enough cannot be said about the creativity and hard work that went into the completion of this unique tribute to tropical Asian wildlife, or about the generosity of the individuals, corporations, and foundations that funded its construction. Chief among the contributors was NYZS Trustee Enid A. Haupt, whose gifts totaled \$4,100,000, including \$1,100,000 in the past year. To quote *The Wall Street Journal's* review of JungleWorld, she "has earned the right to wear a corsage as big as a rafflesia whenever she wants."

JungleWorld was only one of several signal accomplishments in the Society's ninetieth year. At the Bronx Zoo, the new Animal Health Center was dedicated on April 30, 1985, with Bronx Borough President Stanley Simon presiding. Mr. Simon was instrumental in obtaining City funding for the project. Plans were completed for the renovation and restoration of the Elephant House, and work was about to begin. This initial step in the long-range renewal of Zoo Court was given impetus by a \$2,000,000 gift from The Vincent Astor Foundation, which had already provided \$600,000 for planning. The Court itself is renamed Astor Court in recognition of Mrs. Vincent Astor, who, as a contributor since 1962 and Trustee since 1969, has been responsible for some of the Zoo's most significant and acclaimed achievements, including the World of Darkness and Wild Asia. As the fiscal year ended, we also learned that Zoo Center—the area within Astor Court that includes the Elephant House, the Animal Behavior Theater, and surrounding grounds—would receive \$1,000,000 from The Robert Wood Johnson Trust 1962, for which we are particularly grateful to Advisor Robert Wood Johnson IV.

In Central Park, construction of the new Zoo got underway, and the Society received major additional pledges and contributions totaling \$4,000,000 for various aspects of the project from funds associated with the late Lila Acheson Wallace. Other donations included \$200,000 from the Horace W. Goldsmith Foundation.

The Women's Committee, under President Julie Kammerer, conducted two outstanding events on behalf of three capital projects. Proceeds from "Bob Hope at Carnegie Hall" were divided equally between the Central Park Zoo and the Ele-

Mayor Edward Koch toured JungleWorld with NYZS President Howard Phipps, Jr., and General Director William Conway after speaking at the public opening on June 22, 1985.

phant House. The Committee also raised substantial funds for the future African Plaza through its biennial evening event at the Bronx Zoo, on this occasion called "A Night on the Bengali Express."

At the Aquarium, strides were made in the planning and funding of two exciting exhibition facilities. Trustee John R. Hearst, Jr., was responsible for a grant of \$1,000,000 from the William Randolph Hearst Foundation for Sea Cliffs, which will provide coastal habitats for walruses, seals, sea otters, and penguins. And support for the innovative educational exhibits of Discovery Cove was augmented by gifts of \$300,000 from the Charles Hayden Foundation, \$150,000 from Hillside Capital, Inc., through Advisor John N. Irwin III, and \$100,000 from the Bodman Foundation. These two projects, as well as Astor Court and the Central Park Zoo, depend on a combination of private and City support, the basis for the Zoo's and Aquarium's development since their founding.

The \$9,403,680 raised for these and other capital projects was part of \$21,046,175 pledged, given, and bequeathed by members, Trustees, Advisors, and other individuals, corporations, and foundations during the year—\$6,438,005 more than last year's record total. The Development and Conservation Committees, both under John Pierrepont; the Annual Patrons, co-



JungleWorld's principal donor, Mrs. Enid A. Haupt, was honored at the exhibition's dedication on June 21.

chaired by John Chancellor and John Elliott; the Business Committee, co-chaired by Arthur Hauspurg and Peter C.R. Huang; and the Aquarium and Osborn Laboratories Planning Committee, chaired by Dr. Henry Clay Frick II, are particularly to be congratulated for their leadership efforts in conjunction with the Public Affairs staff and on behalf of all the Society's needs.

An extraordinary bequest received during the year testifies to the deep commitment of one of the Society's most devoted friends, Margaret Woolfolk Carter, who died on October 4, 1984. She and her husband, James Walter Carter, staunchly supported the Society for more than twenty years and provided the funding to build the Carter Giraffe Building. After her husband's death in 1981, Mrs. Carter gave more than \$3,700,000 to establish endowed chairs for curatorial and conservation positions in the Society. Her bequest of \$5,400,000 will function as endowment for programs devoted to vanishing species.

The cause of endangered species has also been served by the Dunlevy Milbank Foundation, which gave \$1,000,000 to create the Ella Milbank Foshay Chair in Wildlife Conservation. As a Trustee of the Society until her death in 1983, Mrs. Foshay was deeply concerned with conservation, and now the chair in her name will support the work of WICI Director Dr. George Schaller. Another significant gift came from the Estate of Ruth Parmly, who bequeathed \$452,530 to the Society after ten years as a member.

During Mrs. Haupt's eventful year with the Society, which culminated in the dedication of JungleWorld, she also became a member of the Executive Committee. Welcomed to the Board of Advisors were George Plimpton, who also joined the Conservation Committee and has been particularly helpful in that area, and Mrs. George K. Moss, who has been a driving force on the Women's Committee for several years. Jane Alexander has contributed strongly to WICI's effort in Belize and is now on the Conservation Committee.

Special thanks are extended to all those cited above and to the many more—staff, members, supporters, and Trustees—who cannot be mentioned here. The Society works as an institution because the base of its support and diverse talents is so broad. For the sake of our fellow creatures and ourselves, let us hope that the base continues to grow.

Howard Phipps, Jr.
President



Bringing a jungle to New York

Jungle animals dwell in a warm, wet, incredibly complex fabric of plants, rocks, soils, and water. The air is moist and heavy, and wild creatures are heard far more than they are ever seen. The tropical forest's structure is so filled with life that it cannot be copied or replaced, only simulated in fragments. Even this is so difficult that, beyond lifeless fabrications in natural history museums, it has not been seriously attempted. Thus, jungles have always been outside the experience of the vast majority of modern city dwellers.

JungleWorld, dedicated at the Bronx Zoo on June 21, 1985, is an attempt to bring some of the jungle's luxuriant life and enigmatic beauty to the people. It is the product of five years work directed by this office, Curator of Exhibition and Graphic Arts John Gwynne, Deputy Director of Operations David Cole, and General Curator James Doherty, aided by members of the zoological staff. The designs of Chief Exhibition Designer Walter Deichmann were executed in a collaborative effort between NYZS staff and the Mervin Larson Company of Tucson, Arizona.

Each day, white-handed gibbons, those most marvelously aerial of all the apes, enthrall youngsters and adults alike with a natural display of grace and confidence in JungleWorld's lower montane rain forest. Malayan tapirs, Indian gharials, silvered leaf-monkeys, proboscis monkeys, mangrove snakes, mudskippers, walking sticks, flying frogs, mugger crocodiles, concave-casqued hornbills, junglefowl, slow loris, and many more crawl, leap, and fly through the various landscapes. Most are zoo-born, but they represent the richest, most beautiful, and fastest vanishing wildlife populations in all the remaining natural world. Their carefully and boldly reproduced habitats in the 1,000,000-cubic-foot JungleWorld reflect the urgency and incisiveness of the Zoological Society's changing role in education and conservation.

Tropical forests now cover but six percent of the world's land area yet provide essential habitat for more than fifty percent of all the kinds of plants and animals on earth. They determine the quality of our air, sustain vital water tables, affect rainfall, and, most importantly, are our richest storehouse of genetic diversity. They are now being cut down or burned at the rate of about fifty acres each minute. In fifteen years, significant tropical forest will be left only in Amazonia, the Zaire basin,

This mother and baby are part of the country's only breeding program for proboscis monkeys, now at home in the Bornean Mangrove Forest of JungleWorld.



Blue-faced honey eater

and parts of Indonesia. There is no more desperately pressing or discouragingly recalcitrant problem in the preservation of resources for future generations.

The present ecological holocaust is a direct result of growing human populations and their patterns of resource use. Net world human population is increasing at the rate of 150 per minute. By far the fastest rates of population growth are in the tropics, where the tropical forests are.

The death of nature's greatest treasure house ought to matter. Even people half a world away from tropical forests should understand what is being lost; what their children's children are losing. And institutions which have some ability, no matter how small, to affect this course of events should try to do so. JungleWorld is one part of a farspread effort by the Zoological Society to inform, to instill concern, and to directly preserve at least some fragments of nature.

Nothing so characterizes the nature of tropical forest and its inhabitants as its lushness and the beauty of its intricate detail—and diversity; whether it be in the tapestry-like surface of a giant lichen-covered tree trunk, the high-pitched song of a tropical thrush, or the evanescent image of mist rising from a jungle cascade. To bring a compelling semblance of the jungle to the city; to arouse genuine awe and wonder, curiosity, and admiration for a life zone few city dwellers will ever see are JungleWorld's objectives. We want to plant the seeds of caring.

JungleWorld is an experiment. We have tried to break new ground in wild animal care and exhibition and take advantage of what we have learned from the work of others. We were filled with questions.

Could we find ways to separate visitors and JungleWorld animals unobtrusively? Could we keep leaf-eating primates (capable of eating ten leaves a minute!) in lush leafy environments? Could we establish uncommon animals in common JungleWorld spaces in ways sympathetic to their individual biology yet compatible with the requirements of other species and the need for the zoogoer to view them? Could we convey hard information to visitors without damaging the affecting message of the habitats' naturalness and soft beauty?

Not all the answers are yet in hand, but if the power to affect visitors, to arouse concern and admiration for tropical forest is a proper criterion, the experiment is a success.

Rare animal parks and world conservation

JungleWorld continues the Bronx Zoo's "Renaissance" and is the first major facility to be completed under the current capital campaign for the Zoo, Aquarium, and Central Park Zoo. It reflects the Zoological Society as a new kind of institution, one that seeks to strengthen the link between city dwellers and the natural world, and that operates its educational, breeding, and research activities within the context of a worldwide conservation program.

Today's Zoo and Aquarium are in essence "rare animal parks," devoted to protecting and propagating endangered or threatened species (nearly one-third of the Zoo's 750 species and subspecies are so designated). That job requires a broader sphere of action than ever before, extending to the most remote corners of the world. It touches on the need to preserve ecological niches, to work out reasonable and effective accommodations between people and the land that supports them, to work with various systems of government in developing conservation policies, to overcome inertia and powerful opposition.

Indian gharial





Concave-casqued hornbill feeding chick

These are tasks and risks that are undertaken daily by Wildlife Conservation International field scientists. Across the center of Africa WICI now has a series of projects, focusing on elephants, gorillas, pygmy chimpanzees, okapi, and other species, that may help to keep important segments of the rainforests in those countries intact, capable of supporting life. All of those researchers are concerned with land use as well as the biology and behavior of specific animals, and all of them work tirelessly with local communities, as well as regional and national governments.

In Belize, WICI Research Fellow Dr. Alan Rabinowitz was instrumental last year in setting up a reserve for jaguars in the Cockscomb Basin, and other WICI research there should contribute to the development of a rational conservation policy and to the proper management of the young country's great barrier reef.

Meanwhile, WICI Director Dr. George Schaller and his Chinese co-workers published *The Giant Pandas of Wolong*, the first modern history of the world's favorite animal, and Dr. Schaller began a long-term study on behalf of the snow leopard and other endangered animals in the cold Tibetan highlands. WICI projects were also started or continued in other crucial wilderness areas of Asia, South America, and Africa, many of them directly related to breeding, scientific, and educational programs at the Zoo, Aquarium, and Wildlife Survival Center.

Animal Health and City Zoos

Closer to home, the Society realized a major objective by opening the Animal Health Center at the Zoo on April 30, replacing the 1916 Animal Hospital. The potential of the new Center for expanding the Society's capabilities extends far beyond the fact that it is an order of magnitude larger than the old hospital (which was the first zoo animal hospital ever built). The difference is qualitative as well as quantitative. The Center's spacious and well equipped laboratories permit new approaches and have already stimulated a flowering of clinical investigations into animal nutrition and, especially, into the reproduction of vanishing species.

In addition to the Zoo and the Aquarium, the new facility, under Chief Veterinarian Dr. Emil Dolensek, will also serve the necropsy needs of the Staten Island Zoo and the clinical

needs of the zoos in Central Park, Prospect Park, and Flushing Meadows Park as they are renovated and come under Society management. This process has finally begun with reconstruction of the Central Park Zoo. By June 30, the outlines of all the major new structures in the 5.5-acre site could be seen where the old zoo had been demolished. At the same time, planning was pushed ahead for renovations of the Brooklyn and Queens facilities. Models were prepared by the architects, and countless meetings were held with the Department of Parks and Recreation and other City officials. Assiduously supervising the overall program is Director of the City Zoos Project Richard Lattis.

Wildlife Survival Center

In Georgia, the Zoological Society's wild animal propagation program took a major step forward with the signing of a long-term contract between the Society and the St. Catherines Island Foundation. The year at the Wildlife Survival Center was marked by the first birth of a gemsbok through artificial insemination (on May 9), an accomplishment in itself and a preliminary step toward the embryo transfer breeding of Arabian oryx, a related but much rarer antelope species.

Also at the Center, an experimental "liberty" program was initiated involving ring-tailed lemurs bred at the Zoo. Thus far, the lemurs have readily adapted to their freedom. Success with this program may not only point the way to managing larger numbers of vanishing primates in conditions of semi-liberty, but may enable the better development of clues to reintroducing "difficult" captive-reared higher primates into old habitat or even new "wildland" areas designated for their preservation. At the same time, a liberty program continued at St. Catherines for sandhill cranes, a group of which was to be released in the wild after being raised on the island.

New developments at the Aquarium

Submerged in drawings and blueprints all year, the Aquarium found itself in the happy beginning of a major expansion, while at the same time experiencing a strong upsurge in annual attendance. The first of the planned improvements is Discovery Cove, a new approach to educational exhibition in aquariums focusing on family learning. Plans were completed and out-to-bid by the end of the year, and further plans had been initiated for Sea Cliffs, a bold new ecologically oriented exhibition of sea mammals and birds.

Water monitor





Gliding frog

In the midst of all this activity, there were two rather special and personal highpoints. In 1934, William Beebe and Otis Barton descended in the Zoological Society's bathysphere to a depth of 3,028 feet off Bermuda to study deep sea life. The Aquarium celebrated the fiftieth anniversary of that historic event with a special exhibition around the bathysphere. Another kind of honor was conferred on NYZS Trustee Nixon Griffis, when a newly discovered fish was named *Holocanthus griffisi*, the Griffis angelfish. Griffis has stimulated innumerable Society programs over the years and has led one expedition after another (and is leading one as this report is drafted).

National publication for WIZE

WIZE ("Wildlife Inquiry Through Zoo Education") was completed and its first module (*Wildlife Diversity*) was contracted for nationwide publication by Dale Seymour Publications. It is the most ambitious zoo education effort ever attempted and has already been tested from the Carolinas to Oregon. Its quality is a tribute to Curator of Education Annette Berkovits and her colleagues. WIZE seeks to motivate a new generation to pursue studies in the life sciences—and to think about the issue of the survival of other species into the next century. Now, prospects are being explored for the dissemination of WIZE in the international arena. Already nations in both Latin America and Africa are seeking to obtain the new program.

The Great Biosphere

One planning effort which occasioned much useful mind-stretching was stimulated by the Battery Park City Authority (BPCA). At the invitation of the Authority, the Society developed a highly imaginative program for a new kind of zoological institution which might be built on the BPCA site. It would be called The Great Biosphere. The work is speculative but has clearly demonstrated the Society's remarkable in-house inventiveness and expertise, especially that of its Exhibition and Graphic Arts team led by Curator John Gwynne. It is too early to say whether some or all of the plan may be used.

Looking ahead

All these developments took place in the Society's ninetieth year. Since April 26, 1895, when the Society was founded, the innovativeness and quality of its programs have had a remarkable national and international impact in environmental education. The Society wields an influence out of all proportion

to its size in the cause of international conservation. But it is time to look ahead.

In our ninety-first year, we are taking stock and examining trends. New needs and new responsibilities are clearly visible as the Society approaches its second century. During the year past, a new vision of the Society has been emerging. In the year ahead, these new ideas will be tested and enlarged. Inevitably, another NYZS will result, providing new and appropriate kinds of public service for changed times.

William Conway
General Director



Black leopard



Mammalizing JungleWorld

As the construction and planting of JungleWorld concluded, the introduction of its inhabitants began. Nearly 300 animals of seventy species, including fifty mammals of twelve species, were released into the tropical habitats and educational galleries, and by June 22, when the building opened, most of these rarely seen creatures were acclimated to their new surroundings.

JungleWorld is a tribute to the vanishing forests of Southeast Asia, and its animals were selected and acquired to help preserve particular species and bring attention to the plight of tropical ecosystems. Some species in JungleWorld are endangered, others rare. Several were established in breeding groups as they might be constituted in nature, and animals were taken from the wild only when it might be helpful to captive breeding.

The troop of proboscis monkeys, one mature male and five females, including a youngster born on October 9, moved into the Bornean Mangrove Forest from no farther away than the old Monkey House. These curious and vulnerable primates, which can swim as well as climb, have lived at the Zoo since 1965 and bred here since 1974. Joined by an older pair from the Dallas Zoo, the JungleWorld group is now the only one in the country and one of the few breeding groups in the world. Living in the same habitat, as they would in nature, are a pair of small-clawed otters acquired from the Rotterdam Zoo and the National Zoo in Washington, D.C.

Also familiar to Bronx Zoo visitors may be the pair of white-handed gibbons—Blackie and Honey—now living in the Lower Montane Rain Forest with their male offspring, born in December. Since 1975, the pair had spent each summer on Gibbon Island in Cope Lake. Other JungleWorld animals either born at the Bronx Zoo or acquired from other zoos include a pair of Malayan tapirs, two black leopards, Malayan mouse deer, Indian fruit bats, slow lorises, Malayan giant squirrels, and tree shrews.

Only the large troop of silvered leaf monkeys, which now clamber over the rocky ledges, buttress-root trees, and tangled lianas of the Lowland Evergreen Rain Forest, comes from the wild. Several zoos have specimens of the species, but they are, for the most part, superannuated and non-breeding. It was apparent that the establishment of a viable breeding program would require the introduction of new individuals.



Shere and one of her cubs, the fortieth snow leopard born at the Zoo since 1966.

Most of the troop were obtained on two gruelling trips to Indonesia by Curator James Doherty. At the Zoo, it then took over nine months of complete attention and careful monitoring by the Mammalogy and Animal Health staffs to produce a healthy, stable, and socially compatible group, acclimated to the Zoo environment.

International events

Asia was the focus of several other important developments concerning the Mammalogy Department and wildlife conservation. Agreements have been drafted that will involve the Malaysian government, the New York Zoological Society, and several North American zoos in cooperative projects combining field research on proboscis monkeys and Sumatran rhinos with programs to ensure their survival through the expansion of reserves and the establishment of long-term captive breeding. Proboscis monkeys are, of course, featured in JungleWorld and are already being studied in Borneo by WICI biologist Elizabeth Bennett.

In the Soviet Union, a Bronx-born female snow leopard arrived at the Moscow Zoo as part of an exchange agreement with the United States under the U.S.-U.S.S.R. Environmental Agreement. In return, the Bronx Zoo received a genetically important male born to wild-caught parents. The Society



A Malayan tapir is fed by JungleWorld's Senior Keeper, Stephen Musso (right), and Keeper Linda Roberts.

also hoped to enhance the breeding program for endangered Siberian tigers at the Singapore Zoo by sending them a female that had produced many cubs in the Bronx Zoo.

Notable births

Some of the Zoo's best-known breeding programs were unusually successful last year. Lowland gorillas, which have not bred at the Zoo for five years, produced three babies, including Tumai, the first-born of Pattycake. Litters of two snow leopard cubs each were born to Shanda, a mother for the

seventh time [with nineteen cubs], and Shere, for the first time. Six Przewalski's horse foals were sired by Vulcan, the stallion from the Soviet Union, proving the value of that exchange program. And three pudu fawns were added to the largest collection of these rare dwarf deer outside their native Chile and Argentina.

Staff activities

Mr. Doherty participated in important meetings on two of the world's most endangered mammals, in both of which the Society has a strong interest. The recently rediscovered black-footed ferret was discussed by more than 200 biologists at the University of Wyoming in September 1984; a month later, the Sumatran rhino was the subject of a three-day conference in Singapore. The latter species is now considered one of the twelve rarest in the world.

Associate Curator Mark MacNamara's work in South America has expanded to include coordination of two WICI projects in the Andean altiplano of northern Chile, both involving species that live in the treeless region above 12,000 feet. Mr. MacNamara also continued to advise on the pudu breeding program in Chile and Argentina.

Dr. Fred Koontz, named Curatorial Trainee in early 1984, participated in conferences on animal nutrition at Chicago's Lincoln Park Zoo and mating strategies at the National Zoo.

Mammal Census, Bronx Zoo (as of December 31, 1984)

Orders	Families	Species and subspecies	Specimens in Zoo	Specimens owned
Marsupialia—Kangaroos, phalanger, etc.	2	4	75	116
Insectivora—Shrews, hedgehogs	2	2	9	9
Chiroptera—Bats	3	10	623 ±	634 ±
Primates—Apes, monkeys, marmosets, etc.	6	24	173	178
Edentata—Armadillos, sloths, anteaters	2	2	4	2
Rodentia—Squirrels, mice, porcupines, etc.	11	24	189	181
Carnivora—Bears, raccoons, cats, dogs, etc.	6	27	86	89
Pinnipedia—Seals, sea lions, etc.	2	2	6	6
Proboscidea—Elephants	1	2	6	7
Perissodactyla—Horses, rhinoceroses, etc.	3	6	44	43
Artiodactyla—Cattle, sheep, antelope, etc.	7	33	572	600
Totals	45	136	1,787 ±	1,865 ±

N.B. Specimens in Zoo include 45 on loan to the NYZS from other collections. Specimens owned include 80 on loan to other collections from the NYZS. There were 64 species listed as endangered in some degree. Births totaled 816.

Guam update and other breeding successes

Emergency measures initiated in early 1984 are beginning to enhance the survival chances of two vanishing bird species indigenous to the Pacific island of Guam. Decimated by tree snakes introduced after World War II, the Guam rail is now practically extinct, and only about thirty-five Guam kingfishers remain in the wild. In response to this dire situation, the Society established two breeding pairs of each species at the Bronx Zoo as part of an interzoo conservation program also involving the Philadelphia, San Antonio, Denver, and National zoos.

By June 30, 1985, eleven rails had fledged at the Bronx Zoo, a good start toward the minimum captive population of 150 birds that would be required for sufficient genetic diversity. The kingfishers, which are more difficult to breed, produced only one chick, but it was the first of this species to be successfully reared in captivity.

A total of 1,478 eggs were laid during calendar year 1984, and the number of in hand-reared chicks rose twenty-nine percent. Notable hatchlings included nine red-crested touracos, thirteen Malayan peacock pheasants, and four Mauritius pink pigeons. The Society received AAZPA Significant Achievement Awards for breeding Pesquet's parrots and the drastically endangered pink pigeons.

JungleBirds

All fifteen of the Asian avian species introduced into JungleWorld starting about a month before the building's opening seemed to find the spaciousness and diversity of their new home almost immediately to their liking. Some of the birds, among them Bali mynahs and laughing thrushes, were bred at the World of Birds and transferred to the new exhibition. A male concave-casqued hornbill now flying in JungleWorld with his mate was hatched at the Zoo in 1979. Other specimens, many of them captive bred, include red-billed magpies, glossy starlings, Javan green jungle fowl, and gold-crested mynahs acquired from zoos in Singapore and Jakarta.

Outside the entrance to JungleWorld, a group of Waldrapp ibis, captive bred at Tierpark Rheine in Germany, has been established in an aviary simulating the sandstone cliffs of this endangered species' habitat in Turkey. It is hoped that breeding will begin in about two years.

Federal and state action

After more than a year of negotiations, the case of the 100 palm cockatoos seized by the U.S. Fish

and Wildlife Service was finally resolved. Dr. Donald Bruning, who played a leading role in the talks, escorted eight of the illegally imported birds back to their native Indonesia, where they will be part of a captive breeding program that also involves eleven American zoological organizations. Two breeding pairs are being kept at the Society's Wildlife Survival Center on St. Catherines Island in Georgia. The AAZPA is monitoring this program and is encouraged that its positive ties with the Fish and Wildlife Service may continue in future confiscation cases.

Dr. Bruning was also named to the advisory committee on New York State legislation concerned with the importation and breeding of exotic birds. Working with state legislators, officials of the Department of Environmental Conservation, aviculturists, and pet industry representatives, Dr. Bruning hopes to help create a bill that will protect birds in the wild, encourage captive breeding, and serve as a model for control of the trade of exotic birds in other states.

Prevention and nutrition

Two projects begun by Dr. Christine Sheppard and the ornithology staff involve the transmission of natural disease-preventing materials from adults to nestlings. It was demonstrated in crested tinamou chicks that normal intestinal flora can result from the ingestion of adult feces. Hand-rearing proceeded



Curator Donald Bruning talked with reporters in Jakarta after returning confiscated palm cockatoos to Indonesia.

without resort to antibiotics. A complementary study concerns the transfer of immunizing antibodies in regurgitated materials. Understanding these processes should help to enhance the health and survival rate of hand-reared chicks.

Nutrition is another crucial element of survival and an area that is under constant review. In the past year, Dr. Sheppard, working with the Animal Health Department, has been particularly concerned with the development of a low-iron diet for birds of paradise.

Curatorial activities

Already a member of the AAZPA's board of directors, Dr. Bruning was also appointed chairman of its Wildlife Conservation and Management Committee, which administers the Species Survival Plan (SSP), among other functions. In April, Dr. Bruning represented the AAZPA and the Society's

Wildlife Conservation International (WICI) at the Convention on International Trade in Endangered Species (CITES) meeting in Buenos Aires. He continues to coordinate several conservation and park development projects in Papua New Guinea.

As studbook keeper and SSP coordinator for the white-naped crane, Dr. Sheppard obtained much-needed new stock for breeding at the Bronx Zoo from the Vogelpark in Walsrode, West Germany. Commitments for additional birds have also been made by the Nuremberg and Wuppertal zoos in West Germany and Whipsnade in England. The Tama Zoo in Tokyo has officially presented two female white-naped cranes to the Society as part of the sister cities program with New York City. In February, Dr. Sheppard led a members tour to Patagonia, where the group banded 3,500 Magellanic penguin chicks and was filmed for the National Geographic Cable network.

Bird Census, Bronx Zoo (as of December 31, 1984)

Order	Families	Species and subspecies	Specimens in Zoo	Specimens owned
Struthioniformes—Ostriches	1	1	5	5
Rheiformes—Rheas	1	1	9	9
Casuariiformes—Cassowaries, emu	2	2	6	5
Tinamiformes—Tinamous	2	2	23	20
Sphenisciformes—Penguins	1	1	11	7
Pelicaniformes—Pelicans, cormorants	2	3	12	12
Ciconiiformes—Hérons, storks, flamingos, etc.	5	16	113	118
Anseriformes—Swans, ducks, geese, screamers	9	56	261	264
Falconiformes—Vultures, hawks, eagles	3	7	18	17
Galliformes—Quail, pheasant, etc.	4	26	215	224
Gruiformes—Hemipodes, cranes, rails, etc.	6	26	102	109
Charadriiformes—Plovers, gulls, etc.	8	26	120	120
Columbiformes—Pigeons, doves	1	9	25	17
Psittaciformes—Parrots, etc.	1	19	41	42
Cuculiformes—Touracos	1	6	18	19
Strigiformes—Owls	2	8	15	16
Caprimulgiformes—Frogmouths	1	1	13	13
Apodiformes—Hummingbirds	1	1	1	1
Trogoniformes—Quetzals	1	1	3	3
Coraciiformes—Kingfishers, hornbills, etc.	6	16	38	33
Piciformes—Barbets, toucans, woodpeckers	2	9	23	23
Passeriformes—Perching birds	25	113	273	270
Totals	85	350	1,345	1,347

N.B. Specimens in Zoo include 62 on loan to the NYZS from other collections. Specimens owned include 67 on loan to other collections from the NYZS. There were 69 species listed as endangered in some degree. Hatchings totaled 368.

Year of the crocodile

In recent years, the Bronx Zoo's cobra, giant snake, and endangered turtle and tortoise breeding programs have been especially productive and noteworthy. During the 1970s, the Zoological Society also made a strong commitment to crocodile conservation and propagation. As a consequence, five endangered species have been bred at the Zoo since 1980—Yacare caiman, Siamese and Cuban crocodiles, Chinese alligators, and Malaysian false gavials—an unparalleled accomplishment.

With three of those species reproducing, the past year has been the most successful yet. Eight false gharials hatched on June 30, to become the first offspring of this critically endangered species in a managed program. Chinese alligators have been involved for several years in the Society's breeding program at Rockefeller Wildlife Refuge in southwestern Louisiana. This year they bred at the Zoo, with a young pair on loan from the San Diego Zoo producing five young. They are the first of their kind to hatch in a zoo outside China. Two clutches of hatchling Cuban crocodiles were also added to the ranks. They joined young Cuban crocodiles, hatched in the previous year, in special behind-the-scenes rearing facilities.

JungleWorld acquisitions

Amphibians and reptiles representing fifteen species came from near and far to join the mammals, birds, insects, and fishes in the habitats and galleries of JungleWorld. Several animals were transferred from within the Zoo, notably a group of four Indian mugger crocodiles which had lived in the Reptile House for up to fifteen years after being confiscated from an unauthorized importer by the U.S. Fish and Wildlife Service. These huge creatures now occupy part of the Scrub Forest habitat that starts the journey through JungleWorld.

Other animals were gathered during a trip through five Asian countries—Japan, Singapore, Malaysia, Thailand, and India—by Curator John Behler and Keeper Bruce Foster. The prize was a group of eight six-foot-long Indian gharials from the Kukrail Crocodile Rehabilitation Centre near Lucknow in north-central India. These unusual crocodiles, with their long, needle-like jaws for striking at schools of fish, may grow to twenty feet in length.

Living with the gharials in the Crocodile River Exhibit, funded by the Griffis Foundation, are ten batagurs, or Asian giant river turtles, donated by the Malaysia Department of Wildlife and National Parks. Since females of the species have been har-

vested in large numbers on their nesting beaches, the batagur, like the gharial, is now critically endangered. Both species are being bred on government farms for release back into the wild, and JungleWorld will provide another opportunity for captive breeding.

Several seven-foot-long water monitors, tentacled snakes, painted frogs, leaf frogs, and spiny turtles were also acquired in Asia for the new exhibition complex.

Tortoise breeding, new arrivals

The growing effort to breed endangered tortoises at the Society's Wildlife Survival Center on St. Catharines Island (page 23) was complemented by a conference at the Center in March on nearly extinct angulated and radiated tortoises of the Malagasy Republic. Representatives of the Zoo, the Center, the University of Hawaii, the Roeding Park Zoo in Fresno, and the Malagasy Republic discussed an international program to save these species.



Highly endangered Cuban crocodiles hatched for the second year in the Reptile House.

Hatchings and births at the Reptile House included six Travancore tortoises, four South American big-headed turtles, a double-crested basilisk lizard, a Taylor's cantil, a Sinaloan milk snake, and two bizarre, scaleless Texas ratsnakes. Among the unusual donations were an albino Asiatic cobra and western diamondback rattlesnakes from the New York City Health Department and two dwarf caimans from the personal collection of Joep Moonen, director of the Parimaribo Zoo in Surinam.

Staff activities

For thirty years, Dr. Archie Carr and his students have studied the endangered green turtle at Tortuguero, Costa Rica. Last season the Society joined ranks with the Caribbean Conservation Corporation to assist Dr. Carr in this important mission through a special travel program. Curator Behler and keepers Bob Brandner, Bruce Foster, and Bill Holmstrom led teams of eight volunteers to the nesting beaches, where they marked some 2,500 turtles.

Mr. Behler was appointed coordinator of the new Nixon Griffis Fund for Zoological Research. Open to zoo and aquarium biologists, veterinarians, animal curators, and keepers, the fund is designed to enhance our knowledge and development of wildlife propagation, exhibition, health care, and long-term management. Mr. Behler was elected to the board of directors of the Society for the Study of Amphibians and Reptiles and serves on its Conservation Committee. He was also appointed to the IUCN/SSC Tortoise Specialist Group and the AAZPA Antivenin Committee.



An Indian gharial is released in JungleWorld by Keeper William Holmstrom, Superintendent Peter Brazaitis, Curator John Behler, and Keeper Bruce Foster.

Superintendent Peter Brazaitis received a grant from the Explorer's Club for his investigations of the morphological characteristics of South American caimans and has begun a molecular assay of crocodilian skin protein. Mr. Brazaitis participated in the IUCN/SSC Crocodile Specialist Group Meeting in Caracas, Venezuela, and assisted in establishing a breeding facility for Orinoco crocodiles at Hato Masaguaral. He continues to serve as co-editor of the *Crocodile Specialist Group Newsletter*.

Reptile and Amphibian Census, Bronx Zoo (as of December 31, 1984)

Amphibia orders	Families	Species and subspecies	Specimens in Zoo	Specimens owned
Caudata—Salamanders	1	4	4	4
Salientia—Frogs, toads	6	15	42	41
Totals	7	19	46	45
Reptilia orders				
Testudinata—Turtles	8	48	181	198
Crocodylia—Alligators, caimans, crocodiles	2	15	67	95
Squamata (Sauria)—Lizards	9	27	67	61
Squamata (Serpentes)—Snakes	6	85	323	330
Totals	24	175	638	684

N.B. Specimens in Zoo include 68 on loan to the NYZS from other collections. Specimens owned include 123 on loan to other collections from the NYZS. There were 67 species listed as endangered in some degree. Births and hatchings totaled 165.

Endangered tortoises

In November 1984, the International Union for the Conservation of Nature listed the angulated tortoise as one of twelve nearly extinct species that could be saved by immediate and determined action. Fewer than 200 remain in the Malagasy Republic, where the encroachments of grazing lands and feral bush pigs threaten their survival, while human over-population and economic stagnation preoccupy the political life of the country. In March of 1985, two female angulated tortoises, one from the San Antonio Zoological Gardens, the other from Dr. James Juvik of the University of Hawaii, joined a male already in residence on St. Catherine's to establish the only potential breeding group of the species outside their native land. In addition, the Society is spearheading efforts to create a reserve protecting part of the remaining native habitat, and to initiate a captive breeding program in the Malagasy Republic modeled after that on St. Catherine's.

The Wildlife Survival Center's pivotal role in the conservation of three other tortoise species was demonstrated again this year. Eggs were laid for the second time by the Aldabra tortoises, a very vulnerable species that is restricted to a single atoll in the Seychelles Islands, and for the first time by the yellow-footed tortoises, a South American species that is rarely bred in captivity. Seven hatchlings among the radiated tortoises, another endangered species from Madagascar, contributed to a remarkable total of thirty-two reared on St. Catherine's during the last five years. As a result of this productivity, it was possible to transfer specimens to developing groups at other zoos.

Lemurs and antelopes

A pair of black-and-white ruffed lemurs, spectacular members of the world's most endangered primate group, were among three species added to the Center's mammal collection. With ninety percent of the Malagasy Republic's forests already gone and the rest being chopped down for firewood by an impoverished and rapidly expanding human population, most lemur species may well disappear by the end of the century. These gentle animals are thus a major focus of the Center's propagation efforts.

Although wild-caught lemurs of various species have bred well in captivity, some captive-born lemurs have not. Partly to solve this problem, six ring-tailed lemurs born at the Bronx Zoo were released on the grounds of the Wildlife Survival Center in June 1985. The effect of this free-ranging

lifestyle on mating and reproduction is not yet known, but there has been a marked change in the richness and variety of the lemurs' behavior, which now follows a morning and evening pattern characteristic of the species' activity in the wild. Motor skills and coordination have improved dramatically, and the younger animals, particularly, engage in a great deal of exuberant and exploratory behavior. Using wild food resources has become an increasingly sensitive and discriminating process. If successful, this project could serve as a model for releasing other primate species.

The Center's collection of sitatunga, started in 1976, was dispersed to other breeding programs in order to make way for a newly acquired group of Nile lechwe, or Lady Gray's waterbuck, a shy and rarely seen inhabitant of the Nile's papyrus swamps in the Sudan. Since both species are nervous swamp antelopes, experience with the sitatunga, which produced fifty offspring on St. Catherine's, should help in managing the lechwe. No more than fifty of the latter species are now in captivity.

Bird breeding and release programs

Among seventy-eight hatchlings were seventeen red-fronted macaws. The Center also successfully reared its sixth Pesquet's parrot chick and the twenty-eighth wattled crane chick since breeding was begun for these species.

Blue-billed curassows were added to the Center's growing collection of fowl-like cracids from Central and South America, where they are threatened



Artificial insemination was used for the first time anywhere to produce a gemsbok calf, seen here with its mother on St. Catherine's Island.

by the relentless destruction of forest habitats. Sixteen covered yards were constructed during the year to accommodate breeding groups of four curassow species along with newly arrived gray-winged trumpeters, which are relatively common but will pave the way for the two rarer members of the Psophiidae family from South American forests. The new enclosures will also function as rearing yards for young cranes.

Thirteen Florida sandhill cranes raised during the past three years will be released on Saint Catherine's in August 1985 as part of an effort to reintroduce this species to its former range in coastal Georgia. Hatched from eggs taken from wild parents in the Osceola National Wildlife Refuge in Florida and provided by the United States Fish and Wildlife Service, the chicks were hand-raised and then moved to a remote marshy area of the island to encourage the development of natural foraging and flocking behavior. A cooperative program was initiated in June of 1985 for the endangered American wood stork. Orphaned chicks taken from a rookery at the Savannah River Nuclear Plant in South Carolina will be hand-raised and then released in the wild. The staff of the Saint Catherine's Island Foundation will attempt to reestablish wet

meadow and marsh in order to provide feeding and roosting habitat for this unusual native species. Such areas, originally characteristic of the island, were drained to facilitate agricultural development.

Reproduction and behavioral research

A female gemsbok calf born on Saint Catherine's in March 1985 was the first of its species conceived as the result of artificial insemination. The eventual goal of the project being conducted by the Reproduction Studies Unit of the Society's Department of Animal Health is to use gemsboks as surrogate mothers for embryo transfers from the closely related but critically endangered Arabian oryx. Such techniques hold profound implications for long-term genetic management of endangered species in captivity.

At the Society's invitation, a research team representing the Duke University Primate Center has undertaken a study of the social behavior, activity patterns, and foraging strategies exhibited by the Center's free-living ring-tailed lemurs. The information gained should contribute to a deeper understanding of lemur biology and may be helpful in future efforts to reintroduce lemurs in protected habitats.

Wildlife Survival Center Census (as of December 31, 1984)

	Families	Species and subspecies	Specimens at Center	Specimens owned
Mammalia orders				
Marsupialia—Wallabies	1	1	9	9
Primates—Lemurs	1	1	23	6
Perissodactyla—Zebras	1	1	13	11
Artiodactyla—Antelope	1	9	82	75
Totals	4	12	127	101
Aves orders				
Galliformes—Pheasants	2	5	22	20
Gruiformes—Cranes, bustards	1	7	51	57
Columbiformes—Pigeons	1	1	4	3
Psittaciformes—Parrots	1	7	21	20
Coraciiformes—Hornbills	1	5	23	18
Totals	6	25	121	118
Reptilia orders				
Testudinata—Tortoises	1	4	56	31

N.B. Specimens at Center include 75 on loan to the NYZS from other collections. Specimens owned include 23 on loan to other collections from the NYZS. There were 34 species listed as endangered in some degree. Births and hatchings totaled 150.

The Animal Health Center

An era ended with the closing of the Bronx Zoo's animal hospital after sixty-nine years of continuous operation. The hospital was the first such facility in the world when it opened in 1916, and the first in the United States by eleven years. It was designed by Dr. W. Reid Blair, the New York Zoological Society's first full-time veterinarian, with 2,111 square feet of space devoted to a morgue, dissection room, small- and hooved-animal holding areas, offices, and a small museum.

In this tiny building were evolved many of the basic tenets and practices of modern zoological medicine. Quarantine for new arrivals, parasite control, antibiotic therapy, clinical research, the use of specialists in human medicine, the establishment of biological normals, zoo animal pathology, in-house laboratory services, and many other procedures and concepts were first fully developed at the old hospital.

This tradition is continuing in the new Animal Health Center, but in ten times the space and served by the most advanced medical technology. The veterinary staff moved into the new facility in April and began unraveling activities that had overlapped in the cramped quarters of the old building. On April 30, the Center was officially dedicated by Bronx Borough President Stanley Simon, who had been so helpful in winning City support for its construction.

The new facility enormously enhances the department's clinical and research capacities, with separate suites for animal care, surgery, intensive care, laboratories, pathology, and administration. Already, faster and more accurate methods of studying tissues and of measuring vitamin or antibiotic levels in blood have been introduced. Ultrasound examinations are improving the diagnosis of disease. Videotape recordings being made of surgical



In the Joseph A. Thomas Surgical Suite of the new Animal Health Center, Dr. Janet Stover and veterinary volunteer Russell Cohen examine a snake with ultrasound equipment.

and other procedures will provide another diagnostic tool and a resource for veterinary training.

The Center's animal holding areas, larger than the old building in its entirety, are also highly specialized. By year's end a sea lion had been cared for in a special pool, a gorilla in the mammal ward, various herons and ducks in the avian pool cages, mynah birds in the flight cages, and gaur and deer in the large mammal barn. Likewise, the Joseph A. Thomas Surgical Suite, with its sophisticated equipment and flexibility in terms of animal size, had already been used to full advantage for several of the zoo's most important species, including gorillas, Przewalski's horses, and various endangered deer.

Finally, the new offices, library, and records rooms have given the veterinary staff adequate space in which to work, write, study, and confer. With individual laboratories, the Reproduction Studies Unit and other research programs are being augmented, and nutrition research has been initiated. And the entire building is making possible a more extensive educational program. As one era ends, another begins.

Vitamin E research

After several years of study, it now appears that the serum levels of Vitamin E in unrelated species is fairly constant. What varies is the amount needed in the diet to maintain the proper level, and work continues in this area. It has also been postulated that Vitamin E is essential to fertility, and the lack

of E is the key factor in reducing wildlife reproduction rates during periods of drought in the wild.

Now the ability to carry out these tests has been considerably improved by the addition of high-pressure liquid chromatography equipment, courtesy of the Perkin-Elmer Corporation, for measuring Vitamin E levels in serum, tissues, and feed. Much of this work has been assigned to Dr. Stephanie Combs, a senior nutritionist from Cornell University who has had long experience in this field.

Reproduction Studies Unit

The female gemsbok born on May 9 at the Wildlife Survival Center was the first successful issue of an artificial insemination in this species. This was the start of a series of steps that will test the viability of frozen semen and ultimately the possibility of transferring the embryos of endangered Arabian oryx to the more common gemsboks, used as surrogate mothers.

In January 1985, electron microscopy of the sperm of several rare species, including white-naped cranes, crested tinamou, and red diamond-backed rattlesnakes, was begun by Dr. Cheryl Asa, under the supervision of Dr. David Philips of the Population Council. Her work is concerned particularly with the continued viability of sperm after it has been kept in frozen storage.

Dr. Wendy Westrom and Dr. Minu Chadhuri have employed two different techniques to determine pregnancy in an Indian rhino and an Asian elephant at the Zoo. Dr. Westrom tests urine and blood samples for an unidentified substance which shows up as an early pregnancy factor. This was present in both animals. Dr. Chadhuri looks for changes in urinary levels of two hormones—estrogen and progesterone—to determine the normal reproductive cycle in animals. Elevated progesterone levels, indicating pregnancy, seemed to confirm Dr. Westrom's findings.

The birth of three lowland gorillas during the year focused attention on the Society's central role in the captive management and breeding of this important species. Part of the program involves an attempt to determine the causes for failure to reproduce in certain animals by measuring hormone levels in normal and infertile females at the Zoo. Such information, supplemented by data from new x-ray and ultrasound diagnostic techniques, may help to improve the entire interzoo program of captive breeding for gorillas.



Dr. Emil Dolensek and staff examine Jamie, the Zoo's third new-born gorilla of the year.

Over its fifty-six-year history, the Zoo Education Department has generated a widening circle of activities. Within the Zoo its responsibilities now encompass the Children's Zoo, the llama and camel rides, animal demonstrations in the Children's Theater and the Wildlife Theater, scripts for the Safari Tour Train and the Bengali Express, interpretive texts for exhibitions, Friends of the Zoo volunteers, a full program of classes for both children and adults, and service to more than 350,000 schoolchildren who visit the zoo in organized groups each year.

But the Zoo is also an extraordinary educational resource for audiences beyond the boundaries of the Zoo itself—for the immediate community, for the schools of greater New York, and for students of wildlife biology and conservation throughout the world. In the past year, the department's accomplishments in these areas have been particularly significant.

WIZE for a national audience

A contract to publish *Diversity of Lifestyles*, the first module of Wildlife Inquiry Through Zoo Education (WIZE), was signed with Dale Seymour Publications, a California-based subsidiary of Silver Burdett Company. Developed over a four-year period with Curator Annette Berkovits as Project Director, Manager of Programs Ann Robinson as Co-

ordinator, and Assistant Curator of Interpretive Materials Douglas Falk as Writer, WIZE was scheduled to go on the market in the fall of 1985. The WIZE package, containing a teacher's manual and various student books, discovery cards, and worksheets, is the first nationally available curriculum in science education for sixth- through ninth-grade students to deal with wildlife biology and survival and to coordinate in-depth classroom study with zoo fieldwork.

The project's second module, *Survival Strategies*, was tested by ninth- through twelfth-grade students throughout 1984-85, and final evaluations were due by the end of June. Focusing on life cycles, predator-prey relationships, animal social behavior, conservation, and the role of zoos and wildlife management, this more sophisticated sequel rounds out the WIZE curriculum for middle and high school students. The two modules have already been used in the testing phase by 13,000 students and 167 teachers in sixteen states.

WIZE elicited strong interest at the Association of Secondary School Principals conference in New Orleans and the National Science Teachers Association Conference in Cincinnati, both attended by education staff. The department is also considering WIZE dissemination abroad, particularly to developing nations such as Belize, where the Society conducts related conservation projects.



A winter school tour is introduced to Tus by Assistant Animal Trainer Arthur Martin and FOZ volunteer Rita Murphy.

The Living Planet

Six hundred teachers and science coordinators, representing every public school in New York City from grades seven through twelve, took part in an intensive three-day workshop at the Zoo devoted to *The Living Planet*, David Attenborough's twelve-part television series for the Public Broadcasting Service. Using WIZE and WOW materials, as well as tours of the Zoo and live animal demonstrations, staff curators and instructors conducted seminars on topics ranging from desert ecology to endangered species in order to help teachers integrate the series with a special curriculum devised by the City.

Mr. Attenborough and Mrs. Charlotte Frank, Director of the New York City Board of Education's Division of Curriculum and Instruction, welcomed the teachers and gave their wholehearted support to the program, which was funded by the Mobil Corporation. This model effort to combine the resources of a television series and a cultural, scientific institution in the community was observed by distinguished guests from the educational communities in San Francisco and Detroit.

Educational Adventures

Using the Zoo's exhibits and every available classroom space, general audience courses grew nearly twenty-one percent, with 2,822 individuals participating in forty different programs.

Among the most popular classes for adults were "The Bronx Zoo in Georgia" with James Murtaugh, Associate Curator of the Society's captive breeding outpost for endangered species on St. Catherines Island; "The New Animal Health Center" with Chief Veterinarian Dr. Emil Dolensek; and "Zoo Animal Matchmakers," a study of international captive breeding programs with Registrar Danny Wharton. New family programs included "Wild Pursuit," for animal trivia buffs; "Growing Pains," on the changing status of animal offspring; and "Splash," devoted to the wildlife of the wetlands.

Due to the popularity of the series for very young children, several sessions were added to "Fuzzy, Furry Friends," "Fluffy, Feathery Friends," and "Slippery, Scaly Friends," which introduce the different worlds of mammals, birds, amphibians, and reptiles.

Classes for organized school groups—students and teachers, elementary through high school—increased slightly in enrollment to 15,817. For the first time, a full semester course at the Zoo was offered for credit to ninth- through twelfth-grade students in



David Attenborough, host of television's *The Living Planet*, participated in a three-day workshop at the Zoo.

cooperation with the New York City Board of Education. "Animal Care and Behavior" attracted hundreds of applicants from more than three dozen schools. Because of limited space, only thirty of the most outstanding students were selected for the thirteen-week, forty-five-hour program. Participants felt that the in-depth course had changed their perception of zoos and wildlife, and it is hoped that funding will be available for its continuation.

Two other programs involved the department in broader educational efforts. The Board of Education's Gifted Network offers several school districts the opportunity to use the resources at cultural institutions in the City. Four of the department's programs were included in the Network curriculum, which in this initial phase involves grades three through seven in selected schools.

Developing Arts for the Bronx, sponsored by Bronx Borough President Stanley Simon, funded the Animals in the Arts program for 200 elementary schoolchildren. These special sessions at the Zoo, offered as a follow-up to Windows on Wildlife, stressed the aesthetic appreciation of wild creatures and culminated in a spring art exhibition at the Bronx County Courthouse. Prize-winners attended the department's week-long Zoo Camp or received family memberships in the Society.

Words and sounds for JungleWorld

Working under General Director William Conway and the Exhibition and Graphic Arts Department, Douglas Falk helped with the enormous task of writing interpretive texts for all the exhibits and galleries in JungleWorld. Chairman Richard Lattis and the staff were well advanced in the planning and outfitting of JungleLab, the first classroom to be constructed within a wildlife exhibition. Special course materials were being developed for this

unique outpost, which was funded by the Chase Manhattan Bank.

Audio-Visual Specialist Thomas Veltre was responsible for designing and installing the sophisticated system of speakers, relays, and amplifiers that provide background sound throughout JungleWorld. The sounds were recorded on an NYZS expedition to Thailand led by Veltre and sound expert William Fontana.

Friends of the Zoo

Nearly 200 volunteers gave guided tours, mini-lectures, animal demonstrations, and slide programs for more than 18,000 visitors to the Zoo. The handbook created by FOZ for training its members was published during the year with financing from the Michael Tuch Foundation. Containing a wealth of zoological reference material and flash cards for use in the school tour program, the new book has already proved invaluable and has been purchased by docent organizations at several other zoos.

Children's Zoo Census, Bronx Zoo (as of December 31, 1984)

	Families	Species and subspecies	Specimens in Zoo	Specimens owned
Mammalia orders				
Marsupialia—Opossum	1	1	1	1
Insectivora—Hedgehogs	2	2	4	4
Edentata—Armadillos	1	1	1	1
Lagomorpha—Rabbits	1	1	13	14
Rodentia—Mice, porcupines, etc.	4	5	14	15
Carnivora—Foxes, ferrets	4	5	13	14
Perissodactyla—Horses	1	3	4	4
Artiodactyla—Goats, sheep, camels, etc.	3	6	35	34
Totals	17	24	85	87
Aves orders				
Ciconiiformes—Hérons	2	4	8	8
Pelicaniformes—Cormorants	1	1	1	1
Anseriformes—Ducks, geese	3	4	51	51
Falconiformes—Falcons	1	1	3	3
Galliformes—Chickens	1	3	33	33
Strigiformes—Owls	2	4	6	6
Columbiformes—Doves	1	2	4	4
Psittaciformes—Parrots	1	3	4	3
Totals	12	22	110	109
Amphibia orders				
Caudata—Salamanders	3	4	25	25
Salientia—Frogs, toads	1	1	14	14
Totals	4	5	39	39
Reptilia orders				
Testudinata—Turtles	3	12	43	43
Crocodylia—Alligators	1	1	3	3
Squamata (Sauria)—Lizards	4	5	14	14
Squamata (Serpentes)—Snakes	3	9	24	24
Totals	11	27	84	84

N.B. Specimens in Zoo include 2 on loan to the NYZS from other collections. There were 10 species listed as endangered in some degree. Births and hatchings totaled 33.

Completing JungleWorld

After five years of intensive collaboration among zoologists, designers, artists, horticulturists, graphic specialists, and construction crews, supported by audio, lighting, electronic, and folk-art consultants, JungleWorld went through a series of highly successful previews, beginning with the Women's Committee event on June 5 and culminating in the official public opening on June 22.

Completed during the last year were the great lowland evergreen and lower montane rain forests, the four interpretive galleries, and all the public areas. The Society's staff, in tandem with the Mervin Larson Company, transformed steel, concrete, fiberglass, paint, and epoxy into faithful replicas of lichen-covered limestone outcrops, arboreal ant nests, eroded mudbanks, and giant buttressed trees festooned with tangles of mossy lianas. Landscape muralists completed an enormous trompe l'oeil diorama, covering more than 17,500 square feet of surface. Audio specialists traveled to Thailand to

record subtle background sounds—the popping of fiddler crabs, the distant cooing of a forest dove. Cabinetmakers and exhibit specialists collaborated on the high-tech exhibitory of the galleries.

A new printing process enabled the Society's graphic designers to create a handrail signage system using subtle pencil and color-wash drawings that resemble quick field sketches of animals and plants. Works of Asian folk art—carved dragons from Burma, Balinese woodblocks, and Indian hangings—were combined with replicas of Ganesha sculptures, temple columns, and other cultural embellishments fabricated, gilded, and "aged" by in-house specialists. And work began on JungleLab, the treetop field observatory where classes will be conducted by the Zoo Education Department.

In Wild Asia Plaza, leading up to JungleWorld, construction crews worked through the winter to complete thousands of square feet of new paving, gentries hung with brightly colored banners, a boulder-strewn



The creation of JungleWorld included shaping wire structures for rock formations...



... waterproofing between the concrete layers of a pool bed ...

fountain, and visitor support facilities such as stroller storage areas and booths. The exhibition crew completed a tentlike aviary, with high limestone rock faces simulating an arid Middle Eastern *wadi*, for a flock of critically endangered Waldrapp ibis.

Astor Court

Working with architects Goldstone and Hinz, the department has been coordinating plans for the great domed Elephant House, which was scheduled to start renovation in August. Eventually, the Zoo's entire Beaux-Arts mall, renamed Astor Court in honor of the Vincent Astor Foundation's generous support of the Society, will be architecturally restored and zoologically renewed as a complex of facilities for habitat exhibitions, international conservation, and wildlife education.

Beginning inside the Elephant House, the Exhibition and Graphic Arts staff will first design and construct interpretive galleries devoted to elephants and rhinos. They will also create graphics for the entire complex, indoors and out, and provide rockwork and some other exhibition features for the outdoor habitats.

Holarctic projects

Hundreds of feet of rustic log fencing was installed along the Holarctic Valley's walkway to give this zoogeographic area a continuity it had been lacking. With JungleWorld completed, plans were also made to begin work again on the Himalayan habitat for snow leopards, scheduled to open in 1986. Techniques developed in JungleWorld will be helpful, particularly in creating the rocky highland terrain.

The Great Biosphere

At the request of the Battery Park Authority, the department developed a schematic proposal for an entirely new kind of zoological facility being considered for construction in lower Manhattan. The Great Biosphere, at this stage of very preliminary planning, was to be a multi-story building in which visitors would enter into a dramatic series of exhibitions demonstrating the enormous diversity of life on Earth. The plan emphasized environmental and biological contrasts, the juxtaposition, for instance, of blizzard-swept Arctic ice fields and a serene coral atoll, or mountain goats on a craggy peak and manatees in a mangrove swamp.

Graphic design and production

Rebuilt and outfitted with new film processing and graphic equipment, the production shop was able to turn out hundreds of signs for JungleWorld in record time. The shop was renovated as part of the comprehensive effort to modernize the Zoo's and Aquarium's signage.

At the Aquarium, a special exhibit was designed and installed for the fiftieth anniversary of the historic William Beebe-Otis Barton bathysphere dive off Bermuda. Other Aquarium projects included new graphics for the rebuilt Aquatheater and an updating of the labeling system.

A special series of durable animal graphics for the new Animal Health Center used woodcut designs sandblasted into stone. Graphics were also prepared



... fashioning root tendrils with special plastics ...

for brochures, Annual Meeting programs, banners, interpretive signs for cranes and gibbons, "what's new" signs, and animal identification labels.

Horticulture

Planting in the larger rain-forest half of JungleWorld occupied most of the year. Hundreds of species of tropical Asian plants, ranging from diminutive spike mosses to giant queen cycads, were brought in to complete the meticulously simulated landscape, which combines plants and animals in greater abundance and variety than has ever before been attempted in a zoo exhibition. To maintain and propagate this complex exotic flora, a climate-controlled twenty-by-forty-foot greenhouse was constructed next to JungleWorld.

By contrast, the outdoor Waldrapp Aviary near JungleWorld's entrance re-creates the dry scrubland and limestone cliffs of this rare ibis's Turkish habitat. The plants include potentillas, scabiosa, arabis, and doricum.

Landscaping of the new Animal Health Center began in the fall with the planting of firs, spruces, birches, and oaks. A wide variety of ornamental plants will also help to screen the building, and

therefore protect it, from the commotion of surrounding activities.

Holarctica was the focus of spring planting by two volunteer groups: NYZS members and Bronx Boy Scouts participating in Save Our American Resources. Several hundred plants from northern climes, including witch hazel, spicebrush, azalea, and blueberry, were placed along the visitor paths and around the Polar Bear Exhibit. Large areas of daffodil bulbs planted by the horticulture staff in the fall produced a brilliant array of color throughout the Zoo in May.

A grant from the Norcross Wildlife Foundation has enabled the department to conduct a comprehensive computer inventory of the approximately 23,000 trees in the Zoo. This survey, the first of its kind for a zoological park, will facilitate the care, maintenance, and future planning of the Zoo's flora.

The department also created a curatorial intern program for undergraduates in horticulture, beginning with a single summer internship. The intern is assigned to gardening as well as curatorial tasks, such as the determination of appropriate flora for different zoogeographic zones.



... welding superstructures for tree branches ...

Major projects completed

In the final months before the opening of JungleWorld, artists and tradespeople employed by the Society, the Mervin Larson Company, and other outside contractors, worked long hours to complete the building's habitat exhibitions, interpretive galleries, and mechanical systems. A 400-ton absorption chiller was also installed and put into operation in time for the opening. This air-cooling unit offsets the gain of solar heating that results from the building's extensive skylighted roofs.

Preparations for the large crowds expected to visit JungleWorld involved substantial renovations in Wild Asia Plaza. Work was completed on interlocking brick pavement for the entire plaza, a monumental gateway to Jungle World and the Bengali Express, the Waldrapp Aviary, a landscaped reflecting pool, and a new souvenir stand.

New York City's prime contractor completed construction of the 23,000-square-foot Animal Health Center in March, while the Society's own staff and contractors installed the specialized medical equipment. The building was officially occupied and opened in April.

Major projects underway

The proposed cogeneration and district heating system cleared all environmental requirements, passed Federal government qualifying guidelines, and obtained Public Service Commission approval for a high-pressure natural gas fuel line contract with Con Edison. This proposed new system will update the Zoo's power plant and infrastructure, supply all the Zoo's electrical needs and seventy percent of its thermal needs, and reduce fuel use and costs both for the City and Society. Construction is expected to take two and a half years after all contracts are ratified.

With contracts awarded, renovation of the 1908 Elephant House will begin with the creation of elephant and rhino exhibits inside the building, the modernization of mechanical systems, and the restoration of the palatial structure to its original appearance. Expanded outdoor habitats for the animals and a 1,000-seat Animal Behavior Theater will follow in the second and third phases of the project, which itself is the first step in the renewal of all the buildings on Astor Court.

City- and Society-sponsored improvements

With City support, all the main paths and roadways in the Zoo were repaved and about three

quarters of the public barrier fences were replaced. Phase one of the Energy Conservation Project has been planned to provide new insulation and re-vamped heating and ventilating systems at several exhibit buildings.

A number of improvements were sponsored by the Society. Dual-firing burners were installed in the Carter Giraffe and South American exhibit buildings to permit flexibility in the choice of fuel during periods of shortage. A new trash compactor will centralize this essential operation and reduce costs. Boilers were replaced in the Service and Sky-fari buildings, the heating and ventilating system in the World of Birds was overhauled and updated, and a new electrical distribution system was installed in the Reptile House.



... and simulating lichens on banyan tree roots.



New arrivals, from Canada to China

Beluga whales have long been associated with the New York Aquarium. They were shown by a zoological institution for the first time at the old Battery Aquarium in 1897 and have been on view continuously at Coney Island since 1961. A delight for visitors, these playful creatures have also been a source of study into marine mammal behavior and intelligence. And the Aquarium hopes to establish a captive breeding program for the species as a conservation safeguard.

In order to enhance its exhibition and breeding programs, the Aquarium mounted an expedition in July 1984, with the Mystic Aquarium, to acquire additional belugas from the mouth of the Churchill River on Hudson Bay. As a result, a male and female named Winston and Natasha—each about ten feet long, 1,000 pounds, and three years old—now cavort in the Aquarium's Oceanic Tank, where they quickly acclimated to captivity, responded to training, and charmed visitors. They join long-time Aquarium residents Kathy and Newfy.

Several unusual crustaceans were added to the collection by NYZS Trustee Nixon Griffis, who conducted expeditions in American and southeast Australian waters. From Kentucky came Green River crayfish—North America's largest species of crayfish—and from the other side of the world came Murray River lobsters and giant Tasmanian crabs, one of which weighed twenty-nine pounds. Mr. Griffis was also honored for his many contributions to marine research by having a newly discovered angelfish named after him. The Griffis angelfish (*Holacanthus griffisi*), native to the waters of the Hawaiian Islands, was donated by the Waikiki Aquarium and placed on view in the Main Exhibit Hall.

The strangest acquisitions were twenty-four rare hybrid goldfish donated to the Aquarium by the People's Republic of China through China Resources Products, Ltd. These striking, often grotesque fish from Beijing, cross-bred and inbred for unusual color and physical characteristics, derive from an ancient tradition of competition among the provinces of China.

Births and rescues

Emgee, a forty-two-pound male pup born to Martha and Spook on January 28, brought the Aquarium's group of gray seals to five. Creamy white in his first weeks, the young pinniped has gradually taken on the darker coloration and horselike head of his parents. Other notable offspring include nine stringrays born in the Shark Tank.



The newly discovered Griffis angelfish was named for Nixon Griffis, an indefatigable supporter and activator of NYZS expeditions and programs.

Two animals arrived through the Marine Mammal Stranding Network. One is an adult female harbor seal found off Montauk Point on Long Island. Practically blind and suffering from various wounds, she was nursed back to health at the Aquarium and is now on exhibit with the other harbor seals. At about the same time, in January, a loggerhead turtle was found in a fish trap off Long Island. After being cared for in the Bermuda Triangle Exhibit and the holding facility, the turtle was sent to the Miami Seaquarium for release in warmer water off the Florida coast.

Theater of the deep

Major renovations have expanded the Aquatheater's seating capacity to 1,000 and added new graphics to the stage and entrance. In this setting, the three or four daily dolphin and sea lion performances have been expanded by the animal training staff. Starkey, a new bottle-nosed dolphin, has joined seasoned performers Shilo and Jetty. And Seaweed and Gigi, two California sea lions, now perform as the first duo in the Aquarium's history. They alternate appearances with Breezy, a veteran of more than ten summer seasons.

Gigi was also introduced to the age of cybernetics, with the late Edward A. Fein providing the funding, and Comro, Inc., the robot to aid in the time-consuming but essential task of eliciting basic behaviors. The cooperative sea lion was taught by Aquarium trainers to respond to the robot's signals and to perform at its command. These techniques may prove useful with other marine mammals in the future.

Capital improvements and projects

As part of the Aquarium's overall renewal and expansion, the entrance area of the main building has been renovated to facilitate the flow of visitor traffic. A larger admission area, new doors, improved lighting, a weather-protected entrance, and easily seen schedules for feeding and performance times provide a more comfortable and functional introduction to the Aquarium's exhibits and services.

In the Main Exhibit Hall, new halogen lights are being installed to simulate sunlight. This should encourage natural behavior in some organisms and accentuate the colors of fish, invertebrates, and live plants.

The new seawater intake system, begun in September 1984 and scheduled for completion in late 1985, will also meet the needs of expansion and growing diversity. Supplementing the Aquarium's deep saltwater wells, the new system will provide filtered seawater at rates varying from 600 to 2,000 gallons per minute depending on need, and unfiltered seawater at 200 gallons per minute for invertebrate exhibits that benefit from a natural content of plankton.

This vastly increased supply of seawater also prepares the way for two major new projects being supported by a combination of City and private funds. Discovery Cove, the great participatory ex-

hibition and education hall, reached the final bidding stage before construction by the end of the fiscal year, and Sea Cliffs, the indoor-outdoor sequence of coastal habitats for seals, walrus, penguins, and sea otters, began its design phase in preparation for construction in 1986.

Aquarium Education

One fifth of the Aquarium's attendance over the past year were 121,629 children in 3,766 school groups. In addition, 24,476 children and adults in 591 groups attended classes and programs designed for students from kindergarten through college, teachers, and general audience, including families.

A second successful year of weekend and holiday family programs continued under the title "Beneath Noah's Ark," introducing fifteen new classes, many of them conducted by New York Zoological Society staff. Dr. George Ruggieri, Director of the Aquarium and the Osborn Labs, offered "Marine Pharmacology," surveying the contributions of marine research to human medicine; Curator Dr. Edwin Ernst explored the breeding and rearing strategies of aquatic animals in "Reproduction," and Dr. Paul Cheung once again reviewed his work as an aquatic pathologist in "Fish Doctor."

Children and families were also offered several new three-hour participatory classes as part of Summer Aquatic Adventures, including "Fabulous Fish," "All About Whales," and "The Aquarium in Action." And the series of four two-hour Family Workshops added locomotion and protection to its animal adaptation topics.

The docent program reached some 161,000 Aquarium visitors during the summer of 1984, with twenty-six marine biology students from local high schools participating as volunteers. After a week of training, docents were stationed at ten major exhibit sites to provide information and answer questions on sharks, whales, invertebrates, aquatic birds, seals, and fish. Others worked at special events, assisted behind the scenes in the Education Department, and created programming for a computer contributed the year before by John and Kathleen Hearst. The computer has been especially helpful in developing mailing lists and processing reservations.

Assistance was also provided by interns and volunteers from the City College of New York, Dennyson University, Kings Borough Community College, and the City-as-School and Training Opportunity Program. One of the interns, sponsored by the Exxon Corporation, developed a series of activities concerning sand and water for use in the Chil-



Adding charm to the Aquarium's gray seal collection is Emgee, born in mid-winter.

dren's Cove. This participatory program may also contribute to the planning of materials and activities for Discovery Cove.

Likewise, the Discovery Boxes conceived and created by Instructor Merryl Kafka should also have

application to Discovery Cove's exploratory exhibits. Units on sand and sharks are currently being used for classes in the Education Hall, and others on whales, fish, and invertebrates will soon be in production.

New York Aquarium Census (as of June 30, 1985)

Phylum	Class	Order	Species	Specimens
Chordata	Chondrichthyes—Cartilaginous fishes: Sharks, rays, chimeras	Heterodontiformes—Horn sharks	1	7
		Squaliformes—Typical sharks: Sand tigers, lemons	5	15
		Rajiformes—Rays	2	15
	Osteichthyes—Bony fishes	Acipenseriformes—Sturgeon, paddlefish	2	32
		Semionotiformes—Garfish	2	9
		Amiiformes—Bowfin	1	6
		Elopiformes—Tarpon	1	4
		Anguilliformes—Eels, morays	4	9
		Salmoniformes—Trouts	3	30
		Cypriniformes—Minnows, carp	7	200
		Siluriformes—Freshwater catfishes	8	33
		Batrachoidiformes—Toadfishes	1	33
		Gadiformes—Codfishes	1	1
		Atheriniformes—Platys, swordtails, killifish	3	400
		Beryciformes—Squirlfishes	2	38
		Gasterosteiformes—Seahorses	1	19
		Perciformes—Perches, sea basses, porgies, cichlids	150	700
		Pleuronectiformes—Flatfishes	3	28
		Tetraodontiformes—Puffers, boxfish, triggerfish	9	39
		Osteoglossiformes—Arapaima	1	1
		Dipnoi—Lungfishes	2	3
		Chelonina—Turtles	7	27
	Reptilia	Sphenisciformes—Penguins	1	50
	Aves	Pinnipedia—Seals, sea lions	4	16
	Mammalia	Cetacea—Whales, dolphins	2	9
Cnidaria	Anthozoa—Corals, anemones		30	20,000 ±
Annelida	Polychaeta—Marine worms		3	20
Arthropoda	Crustacea—Lobsters, shrimps, crabs, isopods		12	336
		Arachnida—Horseshoe crabs	1	5
Mollusca	Gastropoda—Snails		4	25
	Pelecypoda—Bi-valves		4	11
	Cephalopoda—Octopus, nautilus		3	39
Echino-dermata	Asteroidea—Starfish		11	116
	Holothuroidea—Sea cucumbers		2	4
	Echinoidea—Sea urchins		5	137
Totals			298	22,417 ±

Fish genetics

Continuing his work of twenty-five years with carefully documented populations of platyfish and swordtails, Dr. Klaus Kallman focused on atypical sex determination and the evolution of the mechanisms that determine sex in fish. Experiments were conducted to test an earlier hypothesis that sex genes are actually controlled by regulatory genes on other chromosomes called autosomes, and that rare variants of the autosomal genes are what cause the occurrence of males with XX chromosomes, rather than XY or YY, and females with XY rather than XX. Results indicate that no more than one or two regulatory genes are involved, that autosomal variants are recessive, and that both the sex genes and the autosomal genes of each *Xiphophorus* species (platyfish and swordtails) are distinct.

The Blue Lobster Project

The pure genetic line of blue lobsters established by Dr. Anthony D'Agostino at his hatchery in Montauk and at the Aquarium over the past ten years produced a second generation of hatchlings which show no ill effects from inbreeding or captive rearing. This is encouraging for the development of hardy and fast-growing strains of colored lobsters and of future aquacultural projects. Supporting research conducted by Dr. Sister Avelin Mary from India, who was awarded an Eppley Foundation post-doctoral fellowship, will eventually be used to determine the shell composition and growth rate of various strains through chemical analysis. Orange, yellow, and calico lobsters were donated to the program during the year by local lobstermen. These additions offer new possibilities for the study of heredity and color hybridization.

Chambered nautilus

Cooperative studies conducted by Dr. John Chamberlain and University of Texas scientists concerned the reduction of strontium-calcium and magnesium-calcium levels in nautilus shells due to the stress of capture and transport. The determination of shell chemistry may also help to distinguish new

species of this ancient deep-water organism of the western Pacific and Indian oceans. How deep the nautilus can go is determined by the strength of its weakest structural element. According to tests conducted during the year, the weak points seem to be the septal sutures—the attachment of the septa to the inner side of the shell wall—which generally fail at a depth of almost 800 feet.

A new high-pressure animal maintenance system developed at the University of North Carolina through the support of NYZS Trustee Nixon Griffis will facilitate such depth experiments in the future. By simulating the normal living depth of the nautilus, this system will make possible an array of studies on growth rate, chamber formation, biomineralization, and reproduction.

Fouling organisms

Dr. Betty Borowsky's research on the *Jassa falcata*, whose tube-building activities foul piers and the hulls of ships, has produced a fascinating profile of this tiny shrimplike crustacean's mating behavior. She discovered that the male actually uses its large claw to protect a receptive female from other males rather than to carry her off as a prelude to mating. Other findings indicate that the male is reclusive during early development, devoting all its energies to growth within the tube. Once fully grown, it can enter the more dangerous and swiftly moving waters in search of a mate. Further data has been gathered concerning the chemical attractant secreted by females which may help eventually to develop a way of interfering with the obstructive tube-building.

Pathology

Necropsies on Aquarium fish conducted during the year by Pathologist Dr. Paul Cheung have identified a new parasite in the liver of a black piranha. Research Fellow Dr. Joe E. Gaskins found parasitic fungi in the kidney of a paddlefish, the kidney of an arapaima, and the liver of a green moray eel. He also completed studies of a fungus from the brain lesion of a smooth dogfish.

City Zoos Project

Central Park Zoo

Construction of the new Zoo, jointly funded by the City of New York's Department of Parks and Recreation and the Society, began officially on April 8, 1985. Heavy rains in May and June delayed the pouring of some foundations, but most had been completed by the end of the fiscal year.

Of the three new buildings being erected around the perimeter of the Central Garden, the Visitor Services Building was nearest completion. The Edge of the Icepack, which will house penguins and puffins, and the Tropic Zone Building were also well advanced. Renovation was about to begin on three existing structures: the 1838 Arsenal Building, to house administrative and education offices; the Monkey House, to become the Heckscher Zoo School; and the Bird House, site of the future Zoo Shop.

Most of the building shells are scheduled for completion by the end of 1985, so that exhibition work can proceed through the winter.

Prospect Park Zoo

A year of work has been directed to refining participatory exhibits and other features of the three principal exhibition areas. Final review of the drawings by City agencies should begin in early 1986. Construction of the zoos in Brooklyn and Queens will be financed by the City of New York.

The existing semicircle of buildings, centered on the sea lion pool, will be renovated and re-used to

create a super children's zoo. In "Animal Life-styles," occupying the central building, the exhibits of mammals, birds, and reptiles will serve to orient visitors to the Zoo as a whole. The "World of Animals" in the south wing will focus on animal adaptations, using live exhibits, graphics, and participatory devices to illustrate such activities as feeding, locomotion, and defense. "Animals in Our Lives," in the north wing, joins an exposition of animals in art with a pet center where children and adults can find a wide range of information about the care and treatment of pets.

Ranged around the outside perimeter of these exhibitions will be habitats for mountain lions and mountain sheep, animals of the Australian outback, treetop wildlife, and baboons, as well as a contact area with goats, ducks, rabbits, and other domestic animals. The 1930s architectural style of the old zoo will be maintained in a new administration and education building.

Flushing Meadows Zoo

At the youngest of the City Zoos, the original exhibits will be improved and new exhibits added to strengthen the exclusive and unique representation of North American wildlife. Habitats for bobcats, pumas, prairie dogs, raccoons, porcupines, and water birds will complement the renovated bear dens, bison range, deer meadow, wolf wood, aviary, and sea lion pool. New educational facilities will be constructed in the old farm area. Final design drawings were nearing completion.



The Polar Circle building for penguins and puffins begins to emerge at the New Central Park Zoo.



The staff and project scientists of Wildlife Conservation International worked in twenty-eight countries around the globe last year, gathering information that might illuminate the biology of endangered species and natural landscapes. They attempted to understand the chain of interdependence that determines the survival of individual organisms and entire ecosystems. They concerned themselves with human and economic needs as well as human and economic destructiveness. They worked closely with local communities as well as regional and national agencies, mostly in developing nations. They supplied basic knowledge that might be used by governments to implement sound conservation practices.

The Tibetan Highlands

On the Tibetan Plateau, WICI Director Dr. George Schaller began a comprehensive survey of wildlife under an agreement between WICI and China's Wildlife Conservation Association. His goals are to determine the status and distribution of such little-known species as snow leopard, wild yak, Tibetan antelope, white-lipped deer, and Tibetan argali sheep; and to find and help establish areas suitable for parks and reserves.

Herdsmen drift across the remote and forbidding 14,000-foot-high plateau of Tibet, their goats, yaks, and sheep competing with wild ungulates for forage in the harsh climate. Because the herdsmen have guns, it is a one-sided competition. Over the next five years, Dr. Schaller will learn about a people and fauna that have rarely been seen by Western observers, with the aim of devising conservation management ideas suitable to the unusual cultural and biological matrix he will encounter.

Giant Panda Project

Dr. Schaller's four-year mission with the panda program in China—involving WICI, World Wildlife Fund-International, and the government of China—was completed in December. With his Chinese co-workers, he produced definitive information on the life of the panda: its reproductive behavior and feeding strategies; its responses, both as individuals and as a population, to fluctuations in food availability; and its spatial requirements. This information contributed to the improvement of panda reserves and to plans for managing pandas within them. Panda conservation research has been left in the hands of several competent scientists, both Chinese and non-Chinese, among them Donald Reid, a Canadian biologist sponsored by WICI.

In spite of his recent move onto the Tibetan Plateau, Dr. Schaller will remain as an adviser to the

Giant Panda Project. As he and his co-authors wrote in their new book, *The Giant Pandas of Wolong*: "By saving the panda we emphasize that constant vigilance and long-term efforts are essential in conservation, for no rare species is ever safe; all endeavors, no matter how immediately effective, are only transitory in a changing world."

Elephants and rhinos

After two years as chairman of the African Elephant and Rhino Specialist Group (AERSG), Dr. David Western, Resource Ecologist for WICI, relinquished the post to Dr. David Cumming, chief ecologist for the Zimbabwe National Park Service. The AERSG, composed of Africa's leading authorities on rhino and elephant management, is now a cohesive team with carefully reasoned goals and excellent lines of communication. Dr. Western will continue as vice-chairman.



With radiotelemetry, Dr. Rodney Jackson has been able to analyze the ecological needs of snow leopards in Nepal.

Poaching remains a major hazard for both elephants and rhinos. This decade may see the end of one race of rhinoceros, the northern white: only about ten remain in the wild, all confined to the poacher-besieged Garamba National Park in Zaire. Black rhinos, however, may be helped in Kenya, where the government, urged by Dr. Western and others, has formulated a National Rhino Plan designed to bring remotely scattered groups of the species into a few heavily guarded reserves.

The survival status of African elephants varies dramatically. Some countries are still plagued by rampant ivory poaching. Others, however, have such large elephant herds that controlled culling has proved necessary. In Zambia, Dr. Dale Lewis continues to monitor elephant populations and to work out long-term plans for land use in the Luangwa Valley. And in Gabon, West Africa, a study

of the forest elephant has been started by Dr. Richard Barnes with WICI support. This subspecies is considered more abundant than the bush elephant of East Africa, and, sadly, it appears now to be suffering the brunt of ivory poaching. Dr. Barnes will survey the status and study the ecology of this reclusive creature, which has so far received little scientific attention.

African rain forest

In September 1984, after a nine-month sabbatical from the field, Dr. Thomas Struhsaker, Research Zoologist for WICI, returned to his Kibale Forest Research Station in western Uganda. This is the fifteenth year of Dr. Struhsaker's investigation of primate evolution and tropical forest ecology at Kibale. Research on a variety of fronts resumed, involving scientists from Uganda, Great Britain, the United States, and Finland.



Mountain nyala have been the focus of Dr. Jesse C. Hillman's ecological research in Ethiopia's Bale Mountain National Park.

Dr. Struhsaker continued his efforts to create an awareness of the value of rain forests to Uganda's future. Together with the United Nations Development Program (UNDP) and Uganda's Ministry of Planning, he helped orchestrate a major conference in the capital city entitled, "Renewable Natural Resources, Ecology and Conservation." Comprehensive in scope, the conference sought to define a course of action that would permit the country to regain its reputation for economic well-being and good environmental management. Forest stewardship was among the most urgently discussed topics.

The conference in Kampala was attended by Dr. Archie Carr, Assistant Director of WICI. He departed Uganda with the conviction that if the conferees' refreshing attitudes toward conservation persisted and spread, the WICI facilities at the Kibale Forest would gain new importance, particularly as a training ground for young conservation scientists. Despite the recent change in government, it appears that the growing commitment to wildlife preservation in Uganda will continue.

Elsewhere in Equatorial Africa, plans were completed for a network of projects, under the guidance of Dr. Struhsaker and Dr. Western, that will place WICI in the forefront of African forest conservation. Included, along with the research of Dr. Struhsaker and Dr. Barnes, were studies of mountain gorillas by Amy Vedder in Rwanda, okapi by John and Terese Hart in Zaire, lowland gorillas by Richard Carroll in the Central African Republic, and pygmy chimpanzees by Dr. Randall Susman and Richard Malenky in Zaire.

Belize

Following two years of jaguar research, Dr. Alan Rabinowitz, along with Dr. Carr, succeeded in persuading the Belizean leadership to declare a pro-

TECTED area for jaguars in the rugged Cockscomb Basin. The agreement came in the fall of 1984. By the following spring, financial support for development of the reserve was obtained from the World Wildlife Fund-U.S. Cockscomb Reserve will carry important symbolic as well as practical significance in Belize, a country that is only now beginning to examine the suitability of park development as an element in social progress.

Meanwhile, WICI launched a major marine research project on the Belize Barrier Reef, to extend over four years. It calls for a close examination of the life history and ecology of the Nassau grouper, a large, economically important fish in the 150-mile-long reef system. Principal investigator for the project is ichthyologist Dr. Jacques Carter, who began work in mid-1984. By mid-1985, Carter and his Belizean colleague, Mrs. Janet Gibson, were devising plans to promote a marine park, incorporating portions of the barrier reef.

New York Headquarters

The WICI staff at the Bronx Zoo was strengthened by the addition of Dr. Mary Pearl as Administrator of Conservation Programs. Dr. Pearl has studied primates in remote parts of Pakistan and Peru. As a zoologist she will contribute to the development and management of the diverse WICI field program.

Immediately upon coming to WICI, Dr. Pearl joined Dr. Western in planning a major conference, scheduled for 1986, that will attempt to forecast the needs of wildlife conservation 100 years from now. It will seek to identify what conservation biologists do not know about the needs of tomorrow. The conference will be held in New York City and is expected to be a watershed for conservation thinking.

Africa

- 1 Wildlife inventory, Kibira National Park Peter Trenchard
Burundi
- 2 Lowland gorilla protected area Richard Carroll
Central African Republic
- 3 Ecology of the mountain nyala in Bale Mountain National Park Chris Hillman
Ethiopia
- 4 Forest elephant Richard Barnes
Gabon
- 5 Zoological monitoring in Amboseli National Park David Western
Kenya
- 6 Support for African elephant and rhino David Western
Kenya
- 7 Capital improvements in Amboseli National Park Government of
Kenya
- 8 Grevy's zebra Joshua Ginsburg
Kenya
- 9 Marine conservation Beryl Kendall
Kenya
- 10 Primate survey, Tana River Clive Marsh
Kenya
- 11 Forest designation and conservation John Oates
Sierra Leone
- 12 Academic support, Sudanese student John Awang-Awok
Mweka College
Tanzania
- 13 Monitoring the Serengeti wildebeest population A.R.E. Sinclair
Tanzania
- 14 The Kibale Forest Project Thomas Struhsaker
Uganda
- 15 Forest surveys Thomas Struhsaker & Peter Howard
Uganda
- 16 Pygmy chimpanzee Randall Susman & Richard Malenky
Zaire
- 17 Elephant management in Luangwa Valley Dale M. Lewis
Zambia
- 18 Black rhino Nigel Leader-Williams
Zambia

Asia and Oceania

- 19 Guam kingfisher Samuel Marshall & Christine Sheppard
Guam
- 20 World tortoise survey Ian Swingland
Indian Ocean
- 21 Effects of forest fire and drought Judith Campbell
Indonesia
- 22 Tropical ecology Mark Leighton
Indonesia

- 23 Proboscis monkey Elizabeth Bennett
Malaysia
- 24 Snow leopard survey and research Rodney Jackson
Nepal
- 25 Fish ecology David Edds
Nepal
- 26 Establishment of provincial park at Ubaigubi for birds of paradise David Gillison & Donald Bruning
Papua New Guinea
- 27 Giant Panda Project George Schaller & Donald Reid
People's Republic of China
- 28 Environmental education James Connor
Southeast Asia, Central America, Africa
- 29 Stump-tailed macaque Uthai Treesucon
Thailand
- 30 Kitti's bat Surapon Duangkhae
Thailand
- 31 Conservation coordination Warren Brockelman
Thailand
- 32 Wildlife surveys George Schaller
Tibet





- 33 Humpback whale studies, Deborah
Hawaii Glockner-Ferrari
& Mark Ferrari
USA

Central America and the Caribbean

- 34 Bahamas parrot study Rosmarie Gnam
Bahamas
35 Comprehensive planning Archie Carr, III
Belize
36 Jaguar reserve Alan Rabinowitz
Belize
37 Nassau grouper and Jacques Carter
Barrier Reef research Belize
38 W.I.Z.E. project Annett Berkovits
Belize
39 Interpretation and environ- Mario Boza
mental education, Costa Rica
Rican National Park Service
40 Tortuguero Park support Juan Carlos
Romero
Costa Rica
41 Leatherback turtle Harold Hirth
Costa Rica
42 Yucatan mud turtle research John Iverson
Mexico

North America

- 43 The cahow and other David Wingate
endangered fauna Bermuda
44 Black-footed ferret, Tim W. Clark
Wyoming USA
45 Risoccean snail study, Robert Hershler
California USA
46 Biological diversity Michael Soule
conference, Michigan USA

South America

- 47 The Magellanic penguin at Dec Boersma &
Punta Tombo William Conway
Argentina
48 Sea lion study Claudio
Campagna
Argentina
49 Support for Patagonian William Conway
conservation group Argentina
50 Valdes wildlife book Graham Harris
Argentina
51 Park management Arturo Tarak
publication Argentina
52 Spectacled bear Bernard Peyton
Argentina

- 53 Flamingo conservation Ivan Castro &
Mark MacNamara
Chile
54 Pudu and huemul in the Mark MacNamara
Andes Chile & Argentina
55 Primates of the Apaporis Thomas Deffler
River Basin Colombia
56 Humboldt penguins Coppelia Hays
Peru
57 Predator-prey relations in John Terborgh &
neotropical forest mammals Louise Emmons
Peru
58 South American fur seal Patricia Mailuf
Peru
59 Ecology of Amazon parrots Charles Munn
Peru
60 Guans, curassows, and Stuart Strahl
oilbirds Venezuela
61 Flamingos Miguelino
Lentino, Mary
Lou Goodwin &
Stuart Strahl
Venezuela



With every division participating, the year culminated in eleven June events, planned and staffed by the Public Affairs Department, which variously previewed, dedicated, and opened the tropical habitat exhibits of JungleWorld. These celebrations marked the end of a record year in fund-raising and membership, with contributions, dues, and bequests from the Society's 46,000 members and donors rising forty-four percent to \$21,046,175. They also signaled a growing public interest in NYZS programs, as reflected in member participation, publicity, and media coverage.

Capital funds

In the current campaign to fund major NYZS projects, \$17,917,811 has been raised since 1983, including \$9,403,680 over the past year.

At the Bronx Zoo, the completion of JungleWorld was made possible by Enid A. Haupt's additional gift of \$1,100,000, which brought her total support for the project to \$4,100,000. The Vincent Astor Foundation gave \$2,000,000 toward the long-term renewal of Zoo Court, which was scheduled to begin in late summer with the renovation of the Elephant House. In honor of Mrs. Vincent Astor's and the Foundation's many years of dedicated support for the Society, the Court was renamed Astor Court by the Trustees.

Aquarium projects were bolstered considerably by several major gifts. Discovery Cove received \$300,000 from the Charles Hayden Foundation, \$150,000 from Hillside Capital, Inc., through Society Advisor John N. Irwin III, and \$100,000 from The Bodman Foundation. The William Randolph Hearst Foundation gave \$1,000,000 toward the construction of Sea Cliffs, which will be named to honor the donor.

Among several contributions to the new Central Park Zoo, now in its initial phase of construction, were a grant of \$200,000 from the Horace W. Goldsmith Foundation and pledges and gifts totaling more than \$4,000,000 from funds associated with the late Lila Acheson Wallace, designated for planning and design costs as well as renovations in the Central Garden area.

Budgetary funds

The Development Committee, in conjunction with other volunteer committees, Public Affairs staff, and Trustees helped raise \$2,748,036 for the general operating support of all NYZS divisions, with \$1,090,758 received from private foundations, \$676,462 from corporations, and \$980,816 from individuals. Endowment pledges and contributions

totalled \$1,194,473, and bequests reached a record of \$5,970,870. Net proceeds from fund-raising benefits were \$640,021.

John Chancellor and Trustee John Elliott, co-chairmen of the Annual Patrons, recruited 272 \$1,000 members last year, a new high for the four-year-old campaign. Other important individual gifts include a \$125,000 three-year pledge from Advisor Shirley Katzenbach to help underwrite two veterinary residents.

The Business Committee, under the guidance of Trustees and co-chairmen Arthur Hauspurg and Peter C.R. Huang, raised support from 136 corporate donors of \$1,000 and over. During the year, a new effort began to seek support from corporations for a full-time nutritionist at the Bronx Zoo.

Private foundations continued to provide significant operating support, highlighted by continued underwriting of the Animal Health Department's Reproduction Studies Unit. The Norcross Wildlife Foundation contributed \$47,150 for an important tree inventory project at the Bronx Zoo.

Two major benefits were organized by the Women's Committee during the year: "Bob Hope at Carnegie Hall" on November 28, and "A Night on the Bengali Express" on June 5, which offered the first preview of JungleWorld. Through these events the Committee entertained over 3,000 guests and raised a record \$541,707.

The Guest Services Department managed 73 exhibit openings, meetings, luncheons, special tours, and briefing sessions during the year. More than 6,200 people came to the Zoo, Aquarium, and other New York sites for these special events.

The Aquarium and Osborn Laboratories Planning Committee raised \$326,584 in support of these facilities. The continued and increased interest by the public and private sectors in these Brooklyn institutions has contributed to their expansion, renovation, and plans for future development.

Conservation funds

Two major endowment gifts solidified support for Wildlife Conservation International, the Society's international conservation program.

In August, the trustees of the Dunlevy Milbank Foundation announced a grant of \$1,000,000 to the Society to establish the Ella Milbank Foshay Chair in Wildlife Conservation. Mrs. Foshay, who died in 1983, played an active role in the Society's conservation activities, having served as Vice-president of the Board of Trustees from 1976 to 1981 and as a

member of several committees, including the Conservation Committee. Dr. George Schaller, Director of Wildlife Conservation International, will be the initial recipient of this endowed chair.

The estate of Mrs. James Walter Carter provided \$5,400,000, which has been designated to function as the Margaret and James Walter Carter Endowment Fund for Vanishing Species. Throughout their long association with the Society, the Carters repeatedly expressed their interest in and support for conservation and the captive propagation of endangered wildlife, especially the large mammals of Africa.

The number of contributors to Wildlife Conservation International increased dramatically, with a near doubling of the active donor base and the continued development of a national constituency. Overall operating support reached \$688,000, including \$350,000 from individuals, \$114,000 from corporations, and \$224,000 from foundations.

Membership

At the end of fiscal year 1984-85, membership in the Zoological Society stood at 27,070, including 6,391 new members. This represents continued growth resulting from successful direct-mail campaigns and membership sales in the Zoo itself.

As enrollment has grown, so has the program's contribution to the Society's operating expenses. Through dues, members added \$1,089,095 to the Society's annual income, \$91,849 more than the previous year. The increase may be ascribed in part to the modest rise in membership rates, which were changed for the first time in ten years. An Individual membership is now \$35.00; Family, \$45.00; Sustaining, \$60.00; and Supporting, \$125.00. Members were given an opportunity to renew at old rates and many chose to do so.

Several NYZS events drew members in unprecedented numbers. A standing-room-only crowd of over 5,000 people came to the Annual Meeting in



One of the year's most popular events for the press is the fall pelican roundup, here joined by Associate Curator of Ornithology Christine Sheppard.

February and more than 400 helped with the Spring Clean-ups at the Zoo and Aquarium. Three evenings that featured a JungleWorld preview as part of the traditional Garden Party elicited an overwhelming response. To accommodate all members who wished to tour JungleWorld, two additional evenings were added. In total, over 14,200 members toured JungleWorld during those five evenings.

Public Relations, Advertising, and Special Events
Several major events during the year helped to focus publicity and advertising for the Zoo and Aquarium and to heighten public awareness of all the Society's programs. The building and opening of JungleWorld attracted global press and media interest, including Gerald Gold's preview article in *The New York Times Magazine*; major reviews in *The Wall Street Journal*, *The New Yorker*, *Newsday*, *The Daily News*, and the *Newark Star-Ledger*; and national and local television and radio coverage, with extended reports on Cable News Network and NBC's *Today Show*. In all, some 2,500 column inches were devoted to JungleWorld in the national press.

Animal births at the Zoo and Aquarium were highlighted last year by the appearance of the gorilla baby Tumai, whose mother, Pattycake, is so well known to New Yorkers as an earlier resident at the Central Park Zoo. On this occasion, the Society produced its first videotaped press release, which was shown in 144 American cities and thirty-three countries around the world.

Worldwide publicity was also generated by a press conference announcing the return of confiscated palm cockatoos to Indonesia, which the Society had arranged jointly with the U.S. Fish and Wildlife Service, and by a series of seminars conducted by the Zoo Education Department in connection with the PBS television series *The Living Planet* and its host David Attenborough.

The activities of Wildlife Conservation International, which are becoming increasingly important in the Society's long-range plans, was given added attention during the year. Long-term marketing strategies were developed to support conservation fund-raising efforts and to promote the new name of this historic NYZS program. Prominent coverage was given to Dr. Dee Boersma's penguin work in

Patagonia by National Geographic Television; to Dr. Alan Rabinowitz's jaguar studies in Belize by a syndicated *Newsday* story; and to conservation efforts on behalf of Kenya's rhinoceroses by *The New York Times*. The *Times* article was widely circulated in Kenya and was instrumental in assisting Kenyan officials to mobilize a national front for rhino conservation.

Advertising for the "New" Bronx Zoo was expanded to take advantage of the JungleWorld opening. And Aquarium advertising continued to feature the popular dolphin behavioral demonstrations. Space for both institutions on fifty billboards around the City was funded by the Philip Morris Company for the month of June.

The fourth annual Elephant Weekend was attended by 40,000 visitors on September 8 and 9. They were treated to such educational and entertaining activities as elephant mask decorating workshops, an expanded Elephant Repertory Theater, traditional Indian dancing and story-telling, a special feast for pachyderms, and the popular elephant tug-of-war, won as usual by Grumpy over the Fordham University football team.

Travel

Most tours sponsored by the Society visited areas in which the Society's Wildlife Conservation International (WICI) is conducting research. At Punta Tombo in Patagonia, Argentina, participants joined in banding Magellanic penguins as a part of the ecological and conservation project of WICI Research Fellow Dr. Dee Boersma. The Kenya and Tanzania Safari, led by Zoo Education Chairman Richard Lattis, included visits to sites where Society conservationists have been working for many years, and in Tortuguero, Costa Rica, four separate teams of eight each were directed in turtle tagging by members of the Herpetology Department. And a small group was helicoptered into Papua New Guinea to observe exotic and endangered birds of paradise. This tour was led by Ornithology Curator Donald Bruning, who is working to establish reserves and breeding programs for these fabled birds. Closer to home, two trips for whale watchers were conducted off Cape Cod, and the 106-foot sloop *Clearwater* took visitors for a day sail on the Hudson River.

Aid for Paradise

The final *Animal Kingdom* published in fiscal year 1984—a special investigation of problems threatening the Serengeti-Mara ecosystem in East Africa—began to yield positive results at the beginning of fiscal 1985. Titled “Paradise Lost?”, that issue (June/July) had an especially favorable impact on the Mara National Reserve, one of Kenya’s most popular tourist destinations and a key factor in the preservation of one of the world’s greatest wildlife spectacles. The report was widely read and discussed in Kenya, according to NYZS Resource Ecologist David Western, who added that it was “. . . considered extremely educative as well as timely and critical, bringing into the open issues too long ignored or suppressed.”

After *Animal Kingdom* exposed poor management in the Mara, Kenya’s Wildlife Conservation and Management Department (WCMD) dismissed the warden for negligence and corruption, replacing him with a man respected for his conservation and management work in Amboseli National Park. This was a temporary arrangement, negotiated with the Narok County Council, but, Dr. Western believes, it almost certainly foreshadows WCMD assuming management of the Mara on a permanent basis. Indeed, a proposal that all county council reserves be brought under WCMD jurisdiction seems likely to become official policy.

The special Serengeti-Mara issue had a positive impact on *Animal Kingdom*’s circulation and revenues as well. An enclosure added in the promotion package mailed in January offered the report as a premium in the form of a bonus issue (“seven issues for the price of six”). The mailing of 125,000 yielded the expected 2.3 percent in gross orders; the best list reached 2.7 percent. But, unexpectedly, twenty-nine percent of these new subscribers paid in advance for their orders; ordinarily about ten percent would be anticipated. This package also received recognition from professional publishing peers: a silver award in *Folio* magazine’s annual competition for magazine direct mail in the category “new subscriptions, consumer special interest.”

Animal Kingdom Reader Profile

By the close of the fiscal year, direct-mail promotion and other sources had increased *Animal Kingdom*’s circulation to an all-time high: 142,042. Not only are there more readers than ever, but, demographically speaking, they have “improved” during the past five years. That conclusion is based on a study of the readership conducted in 1985 by Mark Clements Research. *Animal Kingdom* readers today

are younger, more affluent, and better-educated than they were in 1980, when the first audience survey was conducted. Median age is now 39.88 compared to 45. Median income climbed to \$46,710, versus \$30,190 in 1980, and average income rose to \$63,540 from \$45,290. Among today’s readers, 85.7 percent have spent some time in college, 68.4 percent have degrees and 33.5 percent earned postgraduate degrees. All this demographic data should provide “more powerful ammunition” to sell advertising space.

Also at the end of fiscal 1985 the editors made a major change in the publishing schedule, shifting to a “more normal” sequence. Hence the last issue of the fiscal year became May/June instead of June/July as it had been for many years. Similarly, the calendar year closes with a November/December issue rather than December/January bridging from one year to the next. The frequency—six times a year—remains unchanged, but it is expected that the new schedule will be easier to follow for both readers and advertisers.

Photographic Services

The department completed an important phase in the preservation of its historic photographic negatives. More than 33,000 old negatives were reviewed and stored in new archival quality envelopes. The next step will be to produce second-generation negatives, replacing older films that have historical and zoological significance but have deteriorated severely.

More than 5,000 new color slides and 1,500 new black-and-white photographs were taken and added to the photo library’s already large collection. In response to requests from staff members, department personnel produced and distributed 6,100 black-and-white prints and 1,855 color slides to the staff for various uses.

The Animal Health Center and JungleWorld were the most time-consuming and demanding subjects. Hundreds of photos of these new facilities were used for fund-raising, promotion, and public information. Filming at JungleWorld also continued for a movie that will be shown at the Society’s 1986 annual meeting.

The staff produced two volumes of photographs documenting the Wildlife Survival Center on St. Catherine’s Island for the Edward John Noble Foundation. The photo albums, supplemented with text by scientific staff members, will be used for fund-raising and visitor orientation.

Admissions, Parking, and Transportation

With an extremely strong showing in the spring of 1985, attendance reached 2,167,386 at the Bronx Zoo and 608,563 at the New York Aquarium, the highest totals since 1972. Group sales accounted for 103,375 visitors to the Zoo in 1,638 groups.

Zoo transportation carried more than 1.2 million people, with the Bengali Express monorail in Wild Asia achieving a high of 483,832. The Skyfari, with 438,026, and the Safari Tour Trains, with 311,894, were also well above recent norms. Major maintenance projects included the painting of the Skyfari towers and the monorail columns.

JungleWorld made a remarkable debut on June 22, and was visited by 48,032 people during its first nine days of operating, about thirty-eight percent of Zoo attendance during that time.

Food and Souvenirs

Rising attendance at the Zoo and Aquarium was accompanied by record sales after admissions. This growth was accomplished without major changes or the addition of new restaurants or service stands, though some new food items were introduced and souvenir design was upgraded significantly. Prices to the public increased only moderately and labor and production costs were maintained in line with the previous year.

Planning got underway for the modernization of the Zoo's major eating facilities. Renovation will begin in the coming year with Zoo Terrace and the Zoobar adjoining the Children's Zoo. At the Aquarium, renovations were completed on the cafeteria.

Personnel

At the end of fiscal year 1985, there were 444 full-time NYZS staff members (listed by department on pages 69-72) working at the Bronx Zoo, New York Aquarium, Osborn Laboratories of Marine Sciences, Wildlife Survival Center, and Wildlife Conservation International.

In addition to staff personnel, 612 seasonal workers were employed at the Zoo and Aquarium from April through October selling food and souvenirs, maintaining the grounds, and guiding tours on the Bengali Express monorail and the Safari Tour Train. For many of these young people from the Bronx, Brooklyn, and elsewhere, this was their first job; others have returned year after year while finishing their high school or college educations.

Department staff members continued in outreach programs to help city youth prepare for employment. Great effort and time was expended on training and placement in minority-disadvantaged programs.



High school senior Christine Cappuzzo from Carmel, New York, helped prepare meals for marine mammals as part of her nine-week credited internship at the Aquarium.

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Report of the Treasurer

In fiscal 1985, New York Zoological Society revenues exceeded expenditures by \$31,801. Expenditures were \$25,158,079 for general purposes and \$6,508,362 for capital improvements.

Contributions provided twenty percent of total operating support and revenue. Fund-raising efforts produced a record \$21,046,175, exceeding last year's results by more than \$6,400,000. Included in this total was \$5,400,000 from the estate of the late Margaret Woolfolk Carter. Recognizing Mrs. Carter's life-long interest in wildlife preservation, these funds were designated as endowment to provide income for conservation programs.

Nearly 2,800,000 people visited the Zoological Park and Aquarium, thirteen percent more than last year, occasioning twenty-five and twenty-two percent increases in admission revenues at the Zoological Park and the Aquarium, respectively. Fiscal 1985 reflects a full year of increased admission fees effected in April 1984. The Zoo's free admission policy on Tuesdays, Wednesdays, and Thursdays enabled fifty-seven percent of all visitors to enter without paying any admission fees.

Food, souvenir, transportation, and exhibit fees (visitor service revenues) increased eighteen percent to \$8,247,278. A record \$1,600,000 from this source was available to underwrite capital improvement costs. The Society's ability to generate seed money is essential in attracting private and government support for its capital programs.

Membership dues increased modestly, and the Society's bimonthly magazine, *Animal Kingdom*, reduced its deficit to \$10,000. Only two years ago, it was operating at a \$200,000 deficit. Aggressive circulation efforts coupled with cost controls instituted over several years are showing marked positive results. Endowment and other investment income provided ten percent of revenues. The annualized return on the Society's portfolio over the last five years has been 23.3 percent, ranking the Society's portfolio in the top fifteenth percentile of such funds.

Personnel costs accounted for forty-five percent of the Society's expenditures. Conservation grants, new exhibit costs, and collection accessions represented twenty-three percent. Purchased services, supplies, repairs, food, and forage accounted for nineteen percent. Utilities, cost of goods sold for food and souvenir sales, and other expenses were thirteen percent. Utility costs actually decreased due to a mild winter. Increases in other categories were modest and in line with a lower inflation rate.

At the Zoological Park, JungleWorld was opened in late June. Six years in the making, at a cost of \$9,500,000, this new and exciting exhibit was a tribute to Trustee Enid A. Haupt's perseverance. She generously contributed \$1,100,000 above the



Greenhouse at the World of Birds.

\$3,000,000 she had donated but a year ago. Her gifts combined with earlier funds provided through the Federal Public Works Program, demonstrating again the effectiveness of cooperation between the public and private sectors. Similarly, the new Animal Health Center, a joint effort of the City of New York and the Society, was opened in April to replace the old Animal Hospital of 1916. Design and engineering plans continued to be developed for the Zoo's cogeneration system as well as its Elephant House renovation. A grant of \$2,000,000 from The Vincent Astor Foundation enabled the Society to begin work on the renovation of the great Astor Court, renamed in honor of Mrs. Vincent Astor, who plays such an important role in the Society's plans and policies. Final design was completed for the Discovery Cove at the Aquarium and construction was to begin shortly.

Central Park Zoo plans were completed, bids were accepted by the Board of Estimate, and in April new exhibit construction began.

David T. Schiff
Treasurer



Peat, Marwick, Mitchell & Co.
Certified Public Accountants
345 Park Avenue
New York, NY 10154

The Board of Trustees
New York Zoological Society:

We have examined the balance sheet of New York Zoological Society as of June 30, 1985 and the related statements of support and revenue, expenditures, capital additions and changes in fund balances and of changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

As explained in note 1 to the financial statements, expenditures for land, buildings and equipment are not capitalized, and depreciation of buildings and equipment is, therefore, not recorded. Such practices are not in conformity with generally accepted accounting principles.

In our opinion, except for the effect on the financial statements of the matter discussed in the preceding paragraph, the aforementioned financial statements present fairly the financial position of New York Zoological Society at June 30, 1985 and the results of its operations and the changes in its financial position for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

September 5, 1985

Peat, Marwick, Mitchell & Co.



Malayan wreathed, concave-casqued
and rhinoceros hornbills

New York Zoological Society
Balance Sheet
June 30, 1985

Assets	Operating funds	Endowment funds
Cash, including short-term investments of \$1,700,000	\$ 2,950,868	—
Investments (note 2)	24,381,664	21,050,218
Accounts receivable	349,023	—
Grants and pledges receivable	10,358,503	—
Inventories, at lower of cost or market	491,740	—
Prepaid expenses and deferred charges	686,341	—
	<u>\$39,218,139</u>	<u>21,050,218</u>
Liabilities and fund balances		
Accounts payable and accrued expenses	3,500,192	—
Deferred restricted support and revenue (note 5)	18,479,958	—
	<u>21,980,150</u>	<u>—</u>
Fund balances:		
Unrestricted:		
Designated for long-term investment	15,594,727	—
Undesignated	1,643,262	—
Endowment:		
Income unrestricted	—	6,511,605
Income restricted	—	8,879,351
Term endowment—income unrestricted (note 3)	—	5,659,262
	<u>17,237,989</u>	<u>21,050,218</u>
	<u>\$39,218,139</u>	<u>21,050,218</u>

See accompanying notes to financial statements.

Small-clawed otter



Statement of Support and Revenue, Expenditures, Capital Additions, and Changes in Fund Balances
Year ended June 30, 1985

	Operating funds			Endowment funds
	General	Capital	Total	
Operating support and revenue:				
Contributions and fund raising events, net	\$ 2,419,608	3,773,216	6,192,824	—
Government support:				
City of New York [note 8]	6,934,074	—	6,934,074	—
Other	1,710,770	10,000	1,720,770	—
Admission charges	3,094,102	—	3,094,102	—
Visitor services revenues	6,632,992	1,614,286	8,247,278	—
Membership dues	1,089,095	—	1,089,095	—
Endowment and other investment income	1,993,108	1,046,053	3,039,161	—
Publications and related revenues	886,196	—	886,196	—
Education program revenues	233,098	—	233,098	—
Collection sales	—	64,807	64,807	—
Miscellaneous revenue	196,837	—	196,837	—
Total operating support and revenue	25,189,880	6,508,362	31,698,242	—
Expenditures:				
Program services:				
Zoological Park	15,054,620	5,432,684	20,487,304	—
Aquarium	3,053,765	468,102	3,521,867	—
Survival Center	222,237	—	222,237	—
Wildlife Conservation International	1,271,522	—	1,271,522	—
Marine Sciences	375,912	—	375,912	—
Publications	896,607	—	896,607	—
Membership activities	589,784	—	589,784	—
City Zoos project [note 7]	—	607,576	607,576	—
Total program services	21,464,447	6,508,362	27,972,809	—
Supporting services:				
Management and general	2,333,061	—	2,333,061	—
Fund raising	1,360,571	—	1,360,571	—
Total supporting services	3,693,632	—	3,693,632	—
Total expenditures	25,158,079	6,508,362	31,666,441	—
Excess of operating support and revenue over expenditures, carried forward	31,801	—	31,801	—

Statement of Support and Revenue, Expenditures, Capital Additions, and Changes in Fund Balances (cont'd.)

	Operating funds			Endowment funds
	General	Capital	Total	
Excess of operating support and revenue over expenditures, brought forward	\$ 31,801	—	31,801	—
Bequests	5,970,870	—	5,970,870	—
Release of trustee assets (note 4)	2,017,604	—	2,017,604	—
Realized net gains on investments	1,349,607	—	1,349,607	—
Excess of support and revenue over expenditures before capital additions	9,369,882	—	9,369,882	—
Capital additions:				
Contributions	—	—	—	1,286,971
Realized net gains on investments	—	—	—	2,128,873
Total capital additions	—	—	—	3,415,844
Excess of support and revenue over expenditures after capital additions	9,369,882	—	9,369,882	3,415,844
Fund balances at beginning of year	7,868,107	—	7,868,107	17,634,374
Fund balances at end of year	<u>\$ 17,237,989</u>	<u>—</u>	<u>17,237,989</u>	<u>21,050,218</u>

See accompanying notes to financial statements.



Statement of Changes in Financial Position
Year ended June 30, 1985

	Operating funds	Endowment funds
Resources provided:		
Excess of support and revenue over expenditures before capital additions	\$ 9,369,882	—
Capital additions:		
Contributions	—	1,286,971
Realized net gains on investments	—	2,128,873
Excess of support and revenue over expenditures after capital additions	9,369,882	3,415,844
Items which do not provide resources—realized net gains on investments	(1,878,758)	(2,128,873)
Decrease in accounts receivable	265,657	—
Decrease in inventories	2,281	—
Increase in accounts payable and accrued expenses	1,143,117	—
Increase in deferred restricted support and revenue	6,385,720	—
Total resources provided	15,287,899	1,286,971
Resources used:		
Increase in grants and pledges receivable	3,135,084	—
Increase in prepaid expenses and deferred charges	40,756	—
Purchase of investments, net of sales of \$32,906,360	10,642,057	1,286,971
Total resources used	13,817,897	1,286,971
Increase in cash	\$ 1,470,002	—

See accompanying notes to financial statements.

Notes to Financial Statements
June 30, 1985

(1) Summary of significant accounting policies

The financial statements of the Society have been prepared on the accrual basis except for depreciation as explained below. Other significant accounting policies follow:

Fund accounting

In order to ensure observance of limitations and restrictions placed on the use of available resources, the accounts are maintained in accordance with the principles of fund accounting. This is the procedure by which resources for various purposes are classified for accounting and reporting purposes into funds established according to their nature and purposes. Separate accounts are maintained for each fund; however, in the accompanying financial statements, funds that have similar characteristics have been combined into fund groups.

(continued)

Notes to Financial Statements (continued)

The assets, liabilities and fund balances of the Society are reported in two self-balancing fund groups:

Operating funds, which include unrestricted and restricted resources:

- Unrestricted funds represent the funds available for the support of Society operations.
- Funds restricted by the donor, grantor, or other outside party for particular operating purposes (including accessions and other capital additions) are deemed to be earned and reported as revenues of operating funds when the Society has incurred expenditures in compliance with the specific restrictions. Such amounts received but not yet earned are reported as deferred restricted support.

Endowment funds, which include the following restricted resources:

- Funds that are subject to restrictions of gift instruments requiring in perpetuity that the principal be invested and only the income be used.
- Term endowment funds which must be held intact except that, at some future date or specified occurrence, some portion or all of the principal may be used (see note 3).

Plant assets and depreciation

Plant acquisitions including buildings and improvements constructed on land owned by the City of New York are not capitalized and, accordingly, depreciation is not recorded in the Society's financial statements. Major acquisitions are reflected as capital expenditures in the accompanying financial statements.

Collections

Expenditures for collections are not capitalized.

Other matters

All gains and losses arising from the sale, collection or other disposition of investments and other noncash assets are accounted for in the fund that owned the assets. Ordinary income from investments, receivables, and the like is accounted for in the fund owning the assets, except for income derived from investments of endowment funds, which is accounted for, if unrestricted, as revenue of the unrestricted operating fund or, if restricted, as deferred amounts until the terms of the restriction have been met.

Enforceable pledges for operating purposes, less an allowance for uncollectible amounts, are recorded as receivables in the year made. Pledges for support of current operations are recorded as operating fund support. Pledges for support of future operations are recorded as deferred amounts in the operating fund. Pledges to the endowment funds are recognized upon payment of the pledge.

(2) Investments

Investments are reflected at cost or fair market value at date of gift. The market value and carrying value of investments by fund at June 30, 1985, were as follows:

	Market value	Carrying value
Operating funds—expendable	\$28,668,312	24,381,664
Endowment funds—nonexpendable	27,137,562	21,050,218
	<u>\$55,805,874</u>	<u>45,431,882</u>

Details of investment assets at June 30, 1985, were as follows:

	Market value	Carrying value
Cash	\$ 436,718	436,718
Short-term investments	8,334,250	8,253,857
Corporate stocks	38,550,130	28,665,634
U. S. Government obligations	8,484,776	8,075,673
	<u>\$55,805,874</u>	<u>45,431,882</u>

(continued)

Notes to Financial Statements (continued)

Investment assets of endowment funds and operating funds are pooled on a market value basis with each individual fund subscribing to or disposing of units on the basis of the value per unit at market value, determined quarterly. Of the total units, each having a market value of \$218.96, 123,937 units were owned by the endowment funds and 130,928 units were owned by operating funds at June 30, 1985. The average earnings per unit, exclusive of net gains, approximated \$9.77 for the year.

The following tabulation summarizes changes in relationships between carrying values and market values of investment assets:

	Market value	Carrying value	Net gains (losses)	Market value per unit
End of year	\$55,805,874	45,431,882	10,373,992	218.96
Beginning of year	<u>31,747,742</u>	<u>29,495,223</u>	<u>2,252,519</u>	<u>179.88</u>
Unrealized net gains for year			8,121,473	
Realized net gains for year			4,007,631	
Total net gains for year			<u>\$12,129,104</u>	<u>39.08</u>

The New York State Not-for-Profit Corporation Law, which became effective on September 1, 1970, permits the use of gains on investment transactions of endowment funds subject to certain limitations.

(3) Term endowment (Animal Kingdom Fund)

During 1976, the Society initiated a capital funds campaign. The campaign included a term endowment fund to serve various functions, as described below, subject to the following conditions:

(a) The income of the term endowment fund shall be used for the general operating purposes of the Society; and

(b) The principal of the term endowment fund may be expended only upon the affirmative vote of two-thirds of the Trustees present at any duly held meeting of the Board of Trustees or its Executive Committee: (i) to finance programs or improvements to facilities (i.e., the Zoological Park, the New York Aquarium, or other facilities of the Society) to produce revenue or increase attendance; or (ii) to ensure the survival of the Society if funds from other sources fail to provide sufficient revenue to maintain the Society's programs; provided, however, that in the case of any contribution to the term endowment fund which was subject to a restriction not to expend the principal of such contribution without the prior consent of the donor thereof, in addition to the vote of the Trustees described above, such consent must be obtained in writing prior to the expenditure of such principal.

(4) Pension plan

All eligible Society employees are members of the Cultural Institutions Retirement System's (CIRS) Pension Plan. Pension expense was approximately \$956,000, of which approximately \$462,000 was financed by an appropriation from the City of New York. The current year's provision includes amortization of prior service costs over a period of 30 years commencing June 30, 1974. The Society's policy is to fund pension cost accrued and no unfunded vested benefits existed as of June 30, 1984, the date of the latest plan valuation.

Because the CIRS Plan is a multi-employer plan, certain information as it relates to vested and non-vested benefits as well as plan assets is not readily available.

Certain employees of the Society were formerly participants in the Society's pension fund. Effective July 1, 1975, benefits of the CIRS Plan were substituted for benefits previously accrued under the Society's pension fund. Pension fund reserves were held in trust by the Society's Executive Committee to fund past service liabilities associated with the participants in the prior plan and normal costs of the CIRS Plan. During the current year, it was determined that any liability associated with the prior plan was insignificant. Accordingly, the Executive Committee released the funds to the Society and designated them for long-term investment. It is intended that income from these investments be used to fund pension costs.

(continued)

Notes to Financial Statements (continued)

(5) Deferred restricted support and revenue

The changes in deferred restricted support and revenue for the year ended June 30, 1985, are as follows:

Balance at beginning of year	\$12,094,238
Additions:	
Contributions and fund raising events	11,690,678
Fees and grants from governmental agencies	173,976
Investment income	503,780
Net gains on investment transactions	529,151
Other	232,304
	<u>25,224,127</u>
Less funds expended during year	<u>6,744,169</u>
Balance at end of year	<u><u>\$18,479,958</u></u>

(6) Collections

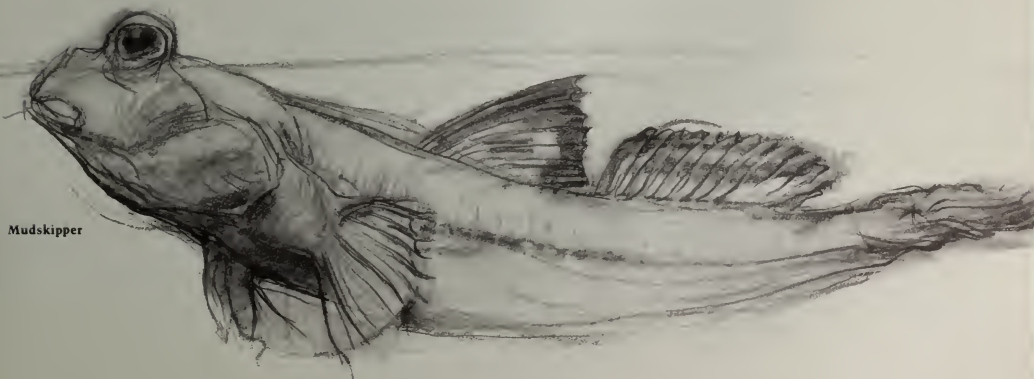
During the year ended June 30, 1985, animal collection accessions aggregated approximately \$300,000 while deaccessions aggregated approximately \$65,000.

(7) City Zoos Project

The Society and the City of New York have entered into agreements with respect to the Central Park Zoo, Prospect Park Zoo, and Flushing Meadows Zoo. Each agreement provides for the City's renovation of these zoos in accordance with plans developed through consultation with the Society and approved by the City, and thereafter, for the Society's operation and management of each with funding from the City, for an initial 50-year term, renewable by the Society for five additional 10-year terms. Except for the Central Park Zoo, the Society will expend no monies for construction. The Society has committed approximately \$10,000,000 toward design and renovation costs at the Central Park Zoo, of which \$4,400,000 has been expended through June 30, 1985.

(8) City of New York support

The Department of Cultural Affairs of the City of New York, in addition to providing general operating support, has reported to the Society that during fiscal 1985 it expended \$1,669,000 at the Zoological Park and the Aquarium for capital improvements. Such expenditures are not included in the accompanying financial statements.



Mudskipper

Contributions, Pledges, and Payments on Pledges of \$1,000 and Over

Annual Patrons and Individuals

Mr. and Mrs. Fred Alger
Charles Allen, Jr.
Mr. and Mrs. Arthur G. Altschul
Mr. and Mrs. Nathan S. Ancell
Mr. and Mrs. K. Tucker Andersen
Mr. and Mrs. Rand V. Araskog
Mr. and Mrs. Leslie H. Arps
Mr. and Mrs. Alan Ascher
Mr. and Mrs. E. Nelson Asiel
Mrs. Vincent Astor
Frank and Barbara Avellino
Mr. and Mrs. David Bady
Caroline A. Baker
Mrs. Louis C. Baker
Mr. and Mrs. Rutgers Barclay
Lorraine Bardsley
Emma Elizabeth Barnsley
Richard T. Baum
Mr. and Mrs. Frederick W. Beinecke
John B. Beinecke
Irene Bellucci
Mr. and Mrs. William R. Berkley
Mr. and Mrs. Joseph Berkman
Mrs. F. Henry Berlin
Sylvester Besch
Mr. and Mrs. John C. Bierwirth
Elsie Bimont
Mrs. Harry Payne Bingham
Mr. and Mrs. H.P. Bingham, Jr.
Mr. and Mrs. H. Gerard Bissinger, II
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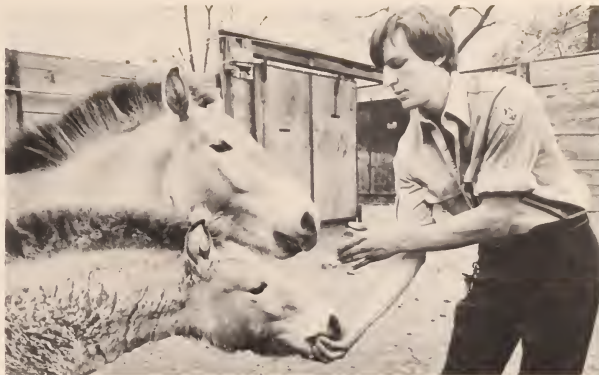
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Ornithology Senior Keeper James Gillespie with a Mauritius pink pigeon.

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Tunko, born on October 4, 1984, with Caroline Atkinson, who has raised five gorillas for the Zoo since 1973.

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The Trustees of the Society recommend that for estate planning purposes, members and friends consider the following language for use in their wills:

"To the New York Zoological Society, a not-for-profit, tax-exempt membership organization incorporated by the laws of the State of New York in 1895, having as its principal address the New York Zoological Park, Bronx, New York 10460, I hereby give and bequeath _____ for the Society's general purposes."

In order to prevent the Society from incurring future administrative cost, it would be helpful if you would consider adding the following language to any restrictions you may wish to impose on your bequest:

"If at some future time, in the judgment of the Trustees of the New York Zoological Society, it is no longer practicable to use the income or principal of this bequest for the purposes intended, the Trustees have the right to use the income or principal for whatever purpose they deem necessary and most closely in accord with the intent described herein."

If you wish to discuss the language of your bequest with a member of the Society's staff, please be in touch with the President's office, (212) 220-5115.

Howard Phipps, Jr.
President





